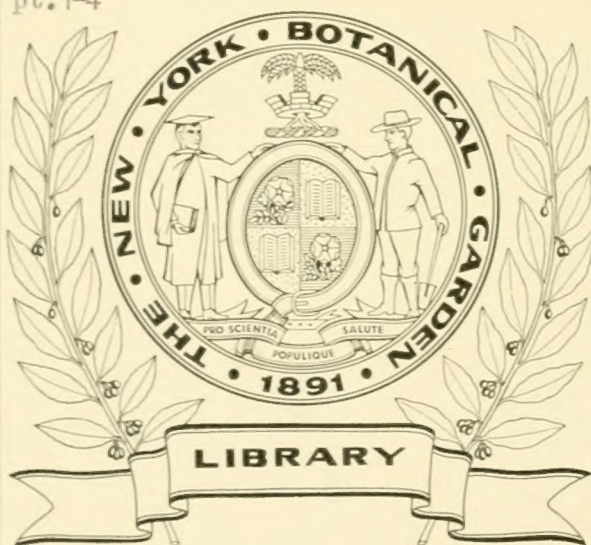


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PEAS OF NEW YORK

BEING

VOL. 1—PART 1

OF

VEGETABLES OF NEW YORK

STATE OF NEW YORK—EDUCATION DEPARTMENT

THE VEGETABLES OF NEW YORK

BY

U. P. HEDRICK

ASSISTED BY

F. H. HALL

L. R. HAWTHORN

ALWIN BERGER

REPORT OF THE
NEW YORK (STATE) AGRICULTURAL EXPERIMENT STATION
FOR THE YEAR ENDING JUNE 30, 1928

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NEW YORK AGRICULTURAL EXPERIMENT STATION

GENEVA, N. Y., *December 10, 1928*

To the Board of Trustees of Cornell University:

Sirs.— I have the honor to transmit herewith manuscript and illustrations for Part I, Volume I, of *The Vegetables of New York*. This is the first installment of a work in three volumes to be entitled *The Vegetables of New York* authorized to be prepared and printed by the New York Agricultural Experiment Station in Chapter 514, Laws of New York, 1925. The manner of printing is provided for in section 2 of the Act just named as follows:

“The said volumes shall be illustrated with colored plates of the various vegetables, contain appropriate text and scientific references, and the printing in every way shall conform to previous volumes of the fruit books published by the said station. Each volume shall consist of two or more parts, each of said parts to treat of a group of related vegetables. These parts may be prepared and printed separately.”

The present plan, a tentative one, is to publish the three volumes in thirteen parts. From time to time manuscripts and illustrations for the remaining eleven or more parts will be sent to the printer without further formal letters of transmission.

Respectfully submitted,

U. P. HEDRICK

Director

PREFACE

This is Part I, Volume I, of *The Vegetables of New York*, a work authorized to be prepared and printed by the New York Agricultural Experiment Station in Chapter 514, Laws of New York, 1925. In object and scope *The Vegetables of New York* does not differ from the seven volumes published by this Station on tree and small fruits. The treatment necessarily differs somewhat, for, because few in number, a volume was published on each of the hardy tree fruits of this region, and another volume on the several small fruits; whereas, more than a half-hundred vegetables must be discussed in the three volumes now begun. The most noticeable difference in treatment is that cultural accounts are not given for any of the vegetables, while the culture of the several fruits was given in the volumes devoted to them. To take space to tell how each of the vegetables are grown would lead the authors far out of the bounds of three volumes, valuable as the matter might be, both from the historical viewpoint and from that of the vegetable grower.

The reader of this preface will want to know in what order the several vegetables will be discussed in these three volumes. Present plans are tentative, but it is now planned that the contents of the three volumes will be about as follows:

Vol. I

- Part 1 Peas.
- Part 2 Beans.
- Part 3 Cucumbers, Squashes, Pumpkins, Muskmelons, Watermelons.
- Part 4 Corn.
- Part 5 Onions, Leeks, Garlic, Shallots, Chives.

Vol. II

- Part 1 Tomatoes, Peppers, Egg Plants.
- Part 2 Lettuce, Chicory, Endive, Salsify.
- Part 3 Celery, Celeriac, Parsnips, Carrots, Parsley.
- Part 4 Asparagus, Rhubarb, Okra, Pot Herbs.

Vol. III

- Part 1 Cabbage, Cauliflower.
- Part 2 Brussels Sprouts, Collards, Kale, Kohl-rabi, Chinese Cabbage, Borecole.
- Part 3 Beets, Chard, Spinach.
- Part 4 Mustard, Cress, Radish, Horseradish, Turnips, Rutebaga.

As in the volumes on fruits, the aim is to make *The Vegetables of New York* a more or less complete record of the development of each vegetable, not only as grown in New York, but as grown in the United States. Briefly, the botanical status of each vegetable is given; full horticultural descriptions of species and their varieties have been made; and as complete a history of the evolution of each vegetable is set forth as will show the reader its past and the present standing.

The considerations which govern the selection of varieties for full description and illustration in this work are: (1) Value of the variety for commercial and home growers of vegetables; (2) Probable value of new varieties; (3) To furnish data for the vegetable breeder by setting forth new characters and showing range in variations; (4) Many sorts are described because of their history to thus better

show what the trend of evolution has been with this or that vegetable; (5) To indicate the relationships of both species and varieties.

The chief value of the three volumes of *The Vegetables of New York* lies in the discussion of varieties. In the descriptions of all of the varieties, the aim is to give as tersely as possible an idea of all the characters of the varieties described. With very few exceptions technical descriptions of varieties are original and are made by those who have taken an active part in the preparation of this book. All of the vegetables having full descriptions have been grown on the Station grounds, with the exception of a few sorts of historical interest, but, whenever possible, specimens and varieties from this locality have been compared with those growing elsewhere.

Far less prominence is given to synonyms for leading varieties in these volumes on vegetables than in any of the books on fruits which have preceded; since synonyms for vegetables are many times greater than for most fruits. The synonyms will be found, not under each variety as in the fruit books, but collected for groups of varieties and printed but once, in small type, at the end of the chapter on descriptions of varieties. In the main, only such references are given as are of use to the writers or thought to be of possible use to some future student of the vegetable in hand.

The botany of some of the vegetables discussed is very complex, not well agreed upon by botanical writers, and in some cases impossible to set forth at this late date in the evolution of vegetables. *The Vegetables of New York* is to be considered, as were the fruit books, a horticultural rather than a botanical work. Yet it is the desire of the authors to set forth the botany of each vegetable as thoroughly as may be. It will be a disappointment if the botanical discussions do not simplify and make plainer the botany of many vegetables.

Varieties of vegetables in *The Vegetables of New York* are being described with other ends in view than identification and statement of value to the cultivator. In particular, it is the desire of the authors that the characters of all of the varieties described be so set forth that the plant breeder may make use of the descriptions. It is supposed, as a working thesis at any rate, that plants have characters, call them elementary-characters or unit-characters as you will, which are more or less independent entities thrown into various relationships with each other in the varieties of species. Thus, before the plant breeder may say, "We must combine such and such characters in varieties and species," he must know what these characters are.

In the preparation of the present installment of *The Vegetables of New York*, the names of those who have taken part in the work appear on the title page. Changes and additions to these names will be made in prefaces to subsequent parts. This statement of authorship, however, does not do justice to one of them, F. H. Hall, who, from start to finish, in the field and in seeing the publication through the press, has taken a leading part. The writer, as senior author, can claim little more credit than for the conception of the work, plans for presenting material, oversight of illustrations, and for the brief chapters on the history of the pea.

U. P. HEDRICK

December 28, 1928

THE VEGETABLES OF NEW YORK. I

LEGUMES, CUCURBITS, CORN, ALLIUMS, ASPARAGUS

PART I: PEAS

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CHAPTER I

HISTORY OF THE GARDEN PEA

Of the many legumes used as human food, the garden pea is one of the commonest and most varied, and is as delectable and as nutritious as any. These attributes of a vegetable usually indicate an ancient origin. In the case of the garden pea, its domestication is so ancient that its wild prototype has never been found, either because it no longer exists or because in its evolution the modern pea has become unlike its ancestor of several thousand years ago. Despite its unknown origin, the main facts in the history of the garden pea, as associated with agriculture, ancient and modern, are well known, although its culture until a few hundreds of years ago was confused with that of the field pea with which, no doubt, it has been hybridized since the remotest culture of the two types.

There are many unmistakable records of garden peas in the writings of the old Greeks, in the bucolics of the Romans, in the voluminous herbals of a few centuries ago; while modern garden writers have given this vegetable as much attention as any other esculent. It could hardly be expected that at this late date one could add much to the long and oft-repeated story of the pea. In any history of the pea, brief or otherwise, the annals as recorded must be accepted essentially as they are found. About all that seems necessary in the chapter in hand, in view of the many accounts of the evolution of peas in print, is an attempt to set forth such facts as will serve as a background to make accounts of species, groups, varieties, and characters in succeeding chapters more easily understood and more usable.

No one knows, nor is it probable that any one will ever discover, from what particular source in plant or territory the garden pea originated. Botanists and plant explorers have many times found spontaneous specimens of *Pisum* in the Old World which they thought might have been the plant from which cultivated peas came, but further study in every case has shown that the supposed parent was the offspring of garden plants relapsed into wildness, rather than vestiges of a parent stock. Just as we do not certainly know the indigenous originals of most of the cereals, of sorghum, sugar-cane, corn, peanut, yam, sweet potato and many other of the plants with which husbandmen are most concerned through immemorial cultivation, so we shall probably never be able to identify the garden pea with its wild original.

Botanists do not even agree as to whether garden peas are derived from one, two, or several wild species. Nor can it be told where are the habitats of all of the several species conjectured by one or another of the writers on *Pisum* as probable ancestors. The ancients did not distinguish carefully between peas, beans, lupines, vetches, chick-peas, and lentils, each with their several kinds, and thus created a vast field for conjecture

in historical and linguistic studies of these several pulses. The modern student who wishes to study the evolution of the pea must begin at an early and plain landmark in its history and travel from there. But first we must assign the garden pea a place in botany and separate it from its near of kin, the field pea.

Garden peas, it will be found in Chapter II dealing with the botany of esculent peas, seem to fit, according to present knowledge, best into the collective species *Pisum sativum* which may be divided conveniently into six sub-species. Of these sub-species but two are of importance to cultivators: namely, *Pisum sativum hortense*, the supposed progenitor of the garden pea; and *Pisum sativum arvense*, from which field peas are supposed to have been evolved. Until very recently, and even by some botanists now, the garden pea was supposed to constitute the species *Pisum sativum*; other botanists place garden peas as derivatives of *Pisum elatius*.

No one can say whether the pea described by the Greek and Latin writers was the garden pea or the field pea. Probably Ruellius in 1536 was the first naturalist to distinguish between the two and he none too plainly so far as characters are concerned. His simple statement is that there are two kinds of peas; one the field pea which is a trailing plant, and the other a climbing plant whose fresh pods and peas are eaten. Brief as this characterization is, botanists and gardeners following Ruellius have kept the two types distinct as either species or sub-species. Probably until the last three centuries, or for a much lesser time, the terms *garden* and *field* peas would suffice to distinguish the classes of cultivated peas for most of those who grew the two kinds, and they are still the only names known by some growers. How may the two sub-species be distinguished horticulturally?

The garden peas, of which there are now several hundred varieties, have white flowers. The seeds are round and smooth, wrinkled or indented; and creamy yellow, or bluish green. The vines are dwarf, half-dwarf, or tall; leaf axils usually green or unpigmented. Garden peas are tender to cold, heat, and drouth. This sub-species may be divided into two well-marked groups for culinary purposes: *shelling peas* of which the seeds, green or ripe, alone are eaten and the pods of which split open at maturity and are lined on the inside by a thin, hard membrane; and *edible podded* or *sugar* peas of which the pods are sweet, tender, not "parchment-lined," and do not become dry and split at maturity. Some botanists put these groups in separate species or at least in two sub-species.

Field peas, to which are ascribed comparatively few varieties, bear colored flowers with standards usually purple or lavender, the wings of deeper red or even purple, and the heel greenish. The pods are smaller

than those of garden peas and are never edible. The seeds are angular or roundish and gray-brown, gray-green, gray-yellow or speckled with dots of various colors. The vines are trailing or less stiffly climbing with strongly pigmented leaf-axils, are hardier to cold, heat, and drouth and the seeds germinate at a lower temperature than do those of garden peas. The seeds of field peas may be used for human food but are usually grown for farm animals and the vine is often cured for forage.

The descriptions given garden and field peas in the preceding paragraphs are those assigned them in botanical texts. As the varieties of the two groups are grown in gardens and fields there is much overlapping of characters: There are purple-blossomed garden peas (mostly edible-podded); dwarf field peas; and seeds and pods are, in one or another character, mutually interchanged on the vines of what probably when men domesticated them were quite distinct types. Rogue plants, year in and year out, hamper the work of seedsmen in their attempts to keep varieties of the two peas true to type. Typical plants of long-established varieties in both sub-species not infrequently mutate and bring forth characters belonging to the other group. One is led to suspect that either the garden and field peas as delimited by the botanists have been developed from one wild original; or, and much more probable, the descendants of two original wild plants have been many times hybridized in the process of producing new varieties.

As has been said, plants of the garden pea have never been found wild. The converging evidence of the several methods utilized in discovering and proving the origin of species, however, seem certainly to show that this sub-species of *Pisum sativum* had its origin in eastern Europe and western Asia. To try now to delimit the exact area in which it grew when men first began to cultivate it would be speculation pure and simple. It is possible that botanists may yet find it in its wild habitation; or it may be that it is a modification of the field pea, *Pisum sativum arvense*, with which many experimenters have found that it readily crosses. In that case the habitat was a vast area in southern Russia and southern Europe where the field pea is said still to grow wild. It is certain that the garden pea is an early introduction in northern Europe and Asia and as far west as England or east in China.

The place of origin of the pea, however, is of small importance. It is much more to the point to the cultivator to know that this vegetable has been grown by man under artificial conditions for thousands of years and to know how much the plant has been altered since men first recorded it as a garden esculent.

Pickering says: "Of culinary vegetables, *Pisum sativum* is the only kind that can with certainty be traced back to the Stone Age."¹ He does not give an authority for the statement but presumably it came from some one of the explorers of the Swiss lake villages

of the Stone Age. His authority may have been Heer for De Candolle says Heer found the garden pea among the relics of the Stone Age at Morssedorf, Switzerland, and also that the same explorer found it in the Bronze Age in both Switzerland and Savoy.² At any rate, almost certainly, the culture of the pea is prehistoric in Europe. One may well assume that the cultivation of peas and all related pulses came into cultivation among the earliest of cultivated plants,—coevals of the flour-yielding cereals. Certainly the pea offers many advantages which all primitive men must have sought in wild foods and they must have been disposed to cultivate this vegetable in the first timid attempts at agriculture.

In primitive ages hunters and graziers must have used the edible seeds of wild pulses as a common source of food supply. From the wild it is but a step to rude cultivation, and the pulses must have been among the most prominent of all esculents in early times for artificial extension: The seed can be kept through several seasons and carried far; the season of growth is comparatively short; cultural requirements are not difficult; they afford food as nourishing as any other plants and for both men and animals; and, probably, early cultivators observed that the pulses thrived on fallow ground, soils too poor for cereals. No doubt these regions and periods were in the Stone and Bronze ages when scarcity of animals forced a meatless diet, times when the pea and related pulses, rich in protein, must have become as now in vast areas of the Old World chief substitutes for meats and fats; must have been necessities without which the human race might easily have perished from the earth.

De Candolle writes that there is no indication of the cultivation of garden peas in ancient India or Egypt; but Sturtevant says the pea in India goes back to a remote period as shown by its Sanscrit name, and that the discovery of its seed in a tomb at Thebes proves it to have been an ancient Egyptian plant.³ Sturtevant does not give authorities for the two statements. Gibault, without citation, gives Piddington as an authority who believed the pea was cultivated in ancient India under the Sanscrit name *harenso* as well as under several other names.⁴ De Candolle thinks Piddington refers to modern and not to ancient India.⁵ It does not seem from available evidence that there is proof of several statements found in the histories of plants that this pea was cultivated in early times in India.

Nor does there seem to be probability that the species early cultivated in Egypt was *Pisum sativum* var. *hortense* or var. *arvense*. *Pisum sativum elatius* grows spontaneously and is more or less cultivated in Egypt, and probably it was this pea that was found in the tombs at Thebes, as it has been in recent years in other tombs in the delta of the Nile. Truth is, in all reports of discoveries of the pea in ancient places, whether through the finding of seeds in ruins, or by application of names from the dead languages, it is

Pickering, C. *Chron. Hist. Pls.* 451. 1879. ² De Candolle, A. *Orig. Cult. Pls.* 329. 1882. ³ Sturtevant's *Notes on Edible Plants* 441. 1919. ⁴ Gibault, C. *Hist. Lég.* 343. 1912. ⁵ *Ibid.* 330.

almost impossible to say what pea or pulse is meant. Thus, a reference is found in the Old Testament to *pulse* in which David in the desert is "brought beds, and basins, and earthen vessels, and wheat, and barley, and flour, and parched corn, and beans, and lentils, and parched *pulse*."¹ But what pulse? Possibly a pea since neither a bean nor a lentil, but what pea? Or, was it a vetch or lupine? It is useless to speculate.

Before going further it may be well to say a few words about names of the peas. The early Greek writers confused the pulses under the names *orobos*, *erebinthos*, and *pisos*, but Theophrastus is definite in the use of these names: *orobos* is the vetch; *erebinthos*, the chick-pea; and *pisos* is the common pea. Etymologists connect *pisos* with the root *pisere*, to pound, to stamp. By this name the pea is not, some say, described as a product that should be ground or stamped; but, rather, as a product of the operations named so that the name *pisos* may have first been applied to pebbles, gravel, or hailstones. Other etymologists believe the word to have come from the name of the operation and was given because only ripe seeds were used and these were thrashed by stamping or flailing. When the Greeks took the pea to Rome, *pisos* became *pisum*, a name eventually passed on to the English as *peason*, then *pease* or *peasse*; the English mistaking these words for plurals dropped the "s" and *pea* became the universal name among English-speaking people for this vegetable.

No botanist nor student of the early history of plants seems to have thought there was any possibility of the garden pea, nor any related peas, having come from central or eastern Asia since wild prototypes are not found in that vast region; and because Chinese records very definitely place its entrance into China at so late a date as the end of the Sixteenth Century when it was known, and still is, as the Mohammedan pea. Besides, that marvelous food-plant, the soy bean, grows wild in many parts of eastern Asia and has been cultivated in China and Japan from the remotest times in these ancient countries, and has furnished fats, butter, and cheese without costly and wasteful intervening farm animals to the Orientals.

That the garden pea and several related species of pulses were cultivated by the early Greeks is certain but it is now impossible to separate the pea from other pulses in the writings of the Greeks since they seemed to have used names interchangeably for peas, lentils, chick-peas, lupines and vetches. Theophrastus, who died 287 B.C., in his *Enquiry into Plants*, devotes Chapter VIII to cereals and pulses in which the pea appears in the list of pulses; directions are given for sowing; we are told peas, beans, and chick-peas come up with several leaves; the plant in leaf, stem, pod, and seed is described; it is said that grubs occur in peas whenever the crop gets too much rain and hot weather supervenes; and much general information is given in regard to the nature, uses, and culture of pulses. It is

apparent from this discussion of peas by Theophrastus that this vegetable had long been widely and commonly grown in Greece both for human consumption and for fodder, yet the plant is not described exactly enough so that one may say whether this common pulse of the Greeks was a field or a garden pea. Small matter even botanists in our own time confuse the two — and it suffices to state with certainty that an edible pea was cultivated by the most ancient Greeks who left records.

To ascertain the origin of any cultivated plant in Europe and to study its history, one turns at once to Theophrastus, Father of Botany, and the author of the oldest treatise on botany extant. But in making use of Theophrastus, the reader must be reminded that the old Greek must not be regarded as a Father of Gardening, entitled though he is to paternity in botany, nor even the distinction of being an early practitioner in growing garden plants. Theophrastus wrote at a time when gardening, farming, orcharding, and the cultivation of flowers and medicinal plants were far advanced, when all food plants derived from the Old World had been named, domesticated, had their varieties and had been cultivated for many centuries. He was writing in an advanced stage of agriculture and civilization; quotes other books about plants and had much of his information from predecessors whom he looked upon as ancient as we look upon him as belonging to an age long, long ago.

We should expect, therefore, and do find that Theophrastus writes of the pea and other pulses as if all Greeks knew them and had long known them — without ascribing to them the novelty in point of history that an American writing today of the products of the New World would have to do in discussing corn, potatoes, beans, pumpkins, and other plants domesticated from the flora of the western continents. We have from Theophrastus, then, an account of the pea as it existed in Greece, an ancient vegetable three centuries before the Christian era.

It is not possible to determine when the cultivated pea was taken to Rome. If it was grown in the time of Cato (149 B.C.) or of Varro (27 B.C.), greatest of early Roman farm writers, the name *pisum* seems not to have been used, and if the pea was cultivated in the time of these Roman farmers it was under some general names then as now *pulse*, or *legume*. But in the first century of the Christian era the pea was well known by the Latins and is mentioned by Columella and Pliny as it was by Virgil in the century before Christ.

It is certain, however, if one may judge from the old farm writers, that the pea was of less importance to the Latins as a vegetable than the chick-pea, lupin, bean, and the vetch. The reason for its neglect probably was that the climate of the Mediterranean countries is a little too warm for the pea, a vegetable which grows best in cool temperate regions.

But while the pea was relatively unimportant in southern Europe it was one of the commonest and most grown vegetables in cooler climates of northern Europe

¹ 2 Samuel, XVII. 28.

for use in the ripened state. Its culture was considered in every early gardening or agricultural book published in any language of middle and northern Europe. It would seem, from the early accounts of the pea on the continent, that in the Dark and Middle ages this crop was grown almost as commonly as any of the cereals,—that is, was a chief resource against the frequent famines and a prominent article in the diet of armies, navies, and commercial shipping. Today, beans and potatoes, introduced from America, have largely taken the place of peas as a winter food in European countries.

The pea was an early food resource of Britain; in 1066 it was one of the chief crops grown in England. According to Rogers, peas are frequently mentioned in the "Expenses of Collegiate and Monastic Houses" between the years 1403 and 1538.¹ He cites as many as sixty-one entries of pottage or porridge peas. It is interesting to note that in these two centuries, so common were peas, that "pottage" and "porridge" meant peas. Thomas Turner, 1577, in *A Hundred Good Points of Husbandrie*, mentions peas and peason several times. Gerarde in his *Herbal*, 1597, gives the first statement of the kinds of peas in England in his day. He says:

"There be divers sorts of Peason differing very notably in many respects. Some are of the garden and some of field, and yet both counted tame. Some with tough skins or membranes on the cods, and others have none at all, whose cods are to be eaten with the Peason when they are young, as those of Kidney Beans; others carry their fruit on the top of the branches, and they are esteemed and taken for Scottish Peason, which is not very common."

Gerarde enumerates the following sorts:

- (1) *Pisum majus* (Rounceval Pease).
- (2) *Pisum minus* (Garden and Field Pease).
- (3) *Pisum umbellatum* (Tufted or Scottish Pease).
- (4) *Pisum excorticatum* (without skins in the cods).

Every British book on vegetable gardening from Gerarde down to the latest out of press discusses about every aspect of pea culture and describes varieties. A few quotations from the most noted garden writers will serve to show the evolution of the pea. Skipping 80 years from Gerarde to John Worlidge's *Systema Horticulture, or the Art of Gardening*, 1677, we find the following very good description of peas grown in the last half of the Seventeenth Century.

"Of Pease

"Pease are of divers kinds, and some of them the sweetest and most pleasant of all Pulses; the meaner sort of them have been long acquainted with our English air and soil; but the sweet and delicate sorts of them have been introduced into our gardens only in this latter age.

"There are divers sorts of Pease now propagated in England, as three several sorts of Hotspurs, the long, the short, and Barns's Hotspur, Sandwich, five sorts of Rouncivals, the Grey, White, Blew, Green and Maple Rouncival. Three sorts of Sugar Pease, the large white, small White, and Grey Sugar Pease. The Egg-Pease, Wing-Pease, and Sickle Pease; whereof the Hot-spurs are the most early, pleasant and profitable of all others. The Sugar Pease with crooked Cods, the sweetest of all. The large white and green Rouncival and the great Egg Pease we shall more particularly advise to be propagated in our Gardens.

"The Hot-spurs are the speediest of growth of any, that being sown about the middle of May will in six weeks' time return ripe again into your hands, no vegetable besides being so quick in its growth and maturity; therefore let these be the first that you sow; if sown in February or March they will come earlier than any other sort sown before winter; but if you sow them in September, and can by Fences of Reed, or otherwise, defend them from extream Frosts, you may have ripe Peascods in May following.

"The large Sugar Pease (which many take to be a fair white sweet Pease succeeding the Hot-spur, but erroneously) is a tender Pease planted in April, and, ripe after midsummer, the cods are very crooked and ill shaped, which being boyl'd with the unripe Pease in them, are extraordinary sweet. The greatest discouragement in raising these, is that their sweetness attracts the small birds unto them, to their total destruction, unless carefully prevented; which is a sufficient argument of their pre-excellency.

"The large white and green Rouncivals, or Hastings, are tender, and not to be set till the cold is over, and then not very thick, for they spread much and mount high, and therefore require the aid of tall sticks, every one knows the worth of them.

"There is another very large grey but extraordinary sweet Pease, that is largely propagated, it is tender but very fruitful, and deserves a large bed in your kitchen garden."

Names of varieties of vegetables seem to have counted for but little in the seventeenth century for at its end, 1693, John Evelyn, most admirable writer on gardening of his times, in his *The Compleat Gardener*, dismisses varieties of peas with this naive discussion:

"Peas or Pease, are multiplied only by seed; there are *great Ones*, *little Ones*, *white Ones* or *yellow Ones*, and *green Ones*. All the world knows they grow in Cods, and are almost round, and sometimes half flat."

It may be of most interest and profit in the further history of the pea to discover so far as possible the beginnings of the several groups of cultivated peas.

Green peas and edible-podded peas.—The ancients seemed to have used only ripe dried peas as a food; in the middle ages the green pods were cooked whole and all peas were therefore edible-podded; still

Rogers, J. Thorald. *History of Agriculture and Prices in England*.

later the pods were cooked whole, dipped in a sauce at the table, much as globe artichokes are now eaten, and the peas were licked out and the pod thrown away; green peas, shelled from the pod and then cooked was the last step in the evolution of the pea as an esculent. Shelled peas were not much used in England until after the restoration of Charles II when they became a very popular delicacy. Ripe peas shelled from the pod were commonly parched, fried, or boiled. Green peas were not common even as late as 1700 according to a paragraph in *Gardeners' Chronicle* who says:

"The taste for Green Peas appears to have been carried to great excess in the time of Louis XIV. *Bonnefonds* mentions them in his *Jardinier Francais*, 1651, and describes them as the Dutch Pea, or Pea without shell; and adds, 'Until very lately they were exceedingly rare.' *Roquefort* says they were first introduced by *M. de Buhl*, the French Ambassador in Holland, about 1600. The author of a *Life of Colbert*, 1695, says, 'It is frightful to see persons sensual enough to purchase Green Peas at the price of 50 crowns per litron' (little more than an English pint). This kind of pompous expenditure prevailed much at the French Court, as will be seen by a letter of *Madame de Maintenon*, dated 10th May, 1696. 'The subject of Peas, continues to absorb all others,' says she; 'the anxiety to eat them, the pleasure of having eaten them, and the desire to eat them again, are the three great matters which have been discussed by our Princes for four days past. Some ladies, even after having supped at the Royal table, and well supped too, returning to their own homes, at the risk of suffering from indigestion, will again eat Peas before going to bed. It is both a fashion and a madness.' "

The name "peascod" was equivalent to our present-day "pea-pod," and a rhyme in the time of King Henry VI ran:

"Were women as little as they are good,
A peascod would make them a gown and hood."

Gerarde in 1597 mentions *Pisum excorticatum* (without skins in the cods), which no doubt was the prototype of the *sans parchemin* pea still commonly grown on the continent but little used in Great Britain or North America. Edible-podded peas differ much more in their pods than those from which the peas are shelled. This is to be expected as, of course, they have been selected for their pods.

White, yellow, blue, green, gray, and spotted peas.—None of the ancients distinguish ripened peas by the color of the seeds, and *Dodonaeus* in his *Fruentorum*, 1566, was probably the first writer to distinguish between the colors, and names white, yellow, green and gray peas. *Parkinson*, 1629, adds spotted peas to the colors. He says:

"The kinds of Pease are these;

| | |
|--------------------|--------------------------|
| The Rounciuall. | The gray Pease. |
| The greene Hasting | The white Hasting. |
| The Sugar Pease. | The Pease without skins. |
| The spotted Pease. | |

The Scottish or tufted Pease, which some call the Rose Pease, is a good white Pease fit to be eaten.

The early or French Pease, which some call Fulham Pease, because those grounds thereabouts doe bring them soonest forward for any quantity, although sometimes they miscarry by their haste and earliness."

Black-eyed peas.—*Townsend*, an English seedsman in 1726, is probably first to mention the black-eyed pea. He gave the variety the name by which it is still known, though but rarely grown, *Black-eyed Marrowfat*.

Round and wrinkled peas.—Probably *Tragus* in 1552 was the first writer to mention wrinkled peas. Wrinkled peas are also recorded in Belgian and German gardens by *Dodonaeus* in his *Fruentorum*, 1566. In his description of *Pisum magus* he says: "The dry seed are angular, uneven, of a white color in some varieties, of a sordid color in others." *Pena* and *Lobel*, 1570, describe the same pea as grown in Belgian and English gardens, and *Lobel* in 1591 illustrates wrinkled peas under the name *Pisum quadratum*. The Great Peason, Garden Peason, or Branch Peason of *Lyte*, 1586, is probably a wrinkled pea as he gives *Dodonaeus'* name as a synonym. *Ray*, 1686, describes wrinkled peas under the name *Rouncival*, and refers to *Gerarde's* picture of *Pisum majus* or *Rouncivall Pease* in 1597 as being the same. *Lisle*, 1708, gives a good description of a wrinkled pea which he calls "honey-combed or pitted." *Thomas Andrew Knight*, however, was the first to bring wrinkled peas into general esteem.

Knight began his work of hybridizing this vegetable in 1787 by which he obtained *Knight's Green Wrinkled* and *White Wrinkled Marrow* peas. The parents, according to *Knight's* account of his work in the *Philosophical Transactions* for 1799, were round white and gray peas, tall and dwarf, in which the wrinkled character had not appeared before. Correlated with the wrinkled skin is rich, sweet, tender flesh, and great productiveness. Thus *Knight's Wrinkled Marrows* became at once a great acquisition both to consumers and cultivators of peas and soon varieties of tall and dwarf, early and late wrinkled peas became the most popular table peas in gardens and on markets. It is surmised by some that this remarkable wrinkled character in peas is a mutation and that there was no record of wrinkledness in peas before *Knight's* work; yet, as has been shown, a wrinkled pea existed before *Knight* made his crosses, and in his account of his experiment from which came the first named wrinkled pea *Knight* says: "In this experiment I used the farina of a White Pea which possessed the remarkable property of shrivelling excessively when ripe."

Dimpled peas.—About the middle of the Nineteenth Century a new type of pea appeared, one having a round seed with compressed sides or even a slight indent in the sides henceforth to be known as dimpled peas. Early Green Marrow and Tall Green Marrow are among the earliest dimpled peas.

Tall and dwarf peas.—Varieties of peas ranging in height of vine from four to twenty-four inches are grouped as dwarf sorts; those from two feet to four feet

as half-dwarfs; from four to eight feet as tall sorts. The peas of the early gardeners, herbalists, and botanists were probably tall peas, because in nearly every case in which cultivation is mentioned it is stated that sticking is required. Camerarius in 1586 divided peas into *Pisum majus* and *Pisum minus*. Probably this is the first instance in which a botanist distinguished between tall peas and half-dwarf peas. True dwarf peas are first mentioned by Tournefort in 1700, although he refers back to their existence in 1665. It is possible that a pea called Middle Peason in England in 1591 is a half-dwarf.

Straight-podded and scimitar-podded peas.—One assumes from the literature that the peas of the ancients and those of the first centuries of its cultivation in northern Europe were straight-podded. The first direct reference to the scimitar-podded pea is found in Worlidge, 1683, in a description of Sugar pease with crooked cods, and in 1686 Ray mentions a "Sickle pease." Two years later in 1688 there is a fuller description of these Sickle pease in the *Art of Gardening* which is quoted on p. 6, not only because of its account of the Sickle pease but of various other sorts as well.

This sketch of the evolution of the garden pea must not be closed without naming the men who have done most to improve modern peas, nearly all of whom are Englishmen. The first and the most noteworthy pea breeder was Thomas Andrew Knight whose experiments with peas were carried on during the last decade of the eighteenth century and the first quarter of the nineteenth.

Knight discovered in 1787 a degenerate pea growing in his garden at Chelsea, England, and pollinated it from the blossoms of a gray pea. There were enormous progeny, most of which grew luxuriantly and gave peas of greatly improved character. Using these two peas for parents for several years he produced in turn Knight's Tall Green Marrow and Knight's Dwarf Green Marrow, two sorts from which some say have come all modern wrinkled peas. Knight's work stimulated other breeders and during the first half of the nineteenth century improved wrinkled sorts were introduced by so many breeders that seedsmen and gardeners could hardly test and keep track of the nomenclature of the introductions. Horticultural societies found it necessary to carry on trials to straighten out the nomenclature of the pea. Of these trials those of the Royal Horticultural Society published results in 1845, 1860 and in 1872 which did much to bring the nomenclature of this vegetable in order.

In 1822, John Goss, resident of Devonshire, published a remarkable paper in the Horticultural Society's Transactions giving an account of the work he had done in hybridizing peas in which was noted most of the phenomena later discovered by Mendel which formed the basis of Mendel's theories. Goss, unfortunately, did not make the interpretation of the principles now associated with Mendel's name, nor seek an explanation of his results in hybridizing as did Mendel. None of Goss' new peas can be named as landmarks in the evolution of this vegetable.

If one puts the introduction of valuable varieties as a criterion of worth in improving peas, perhaps the palm of merit should go to Dr. McLean of Colchester, England, who made his first crossing in 1850 and thereafter for many years introduced one variety after another that became standards of his time. Dr. McLean's aim was to produce early dwarf wrinkled peas. Of these Little Gem was the best known in America and may be taken as the type with which this hybridizer worked.

Thomas Laxton followed McLean, taking the latter's varieties as a basis for his experiments, but widened his endeavors to produce peas earlier, of larger size, such as filled the pod, and to keep the height of vine moderate.

Other prominent breeders of the last half of the nineteenth century were Henry Eckford, noted improver of sweet peas, and W. Culverwell who bred the giant podded sorts of which Telegraph, if not the first, was the most noted and was the forerunner of most of the large podded sorts that have followed. Telegraph, Telephone, Stratagem and Duke of Albany, among the giant podded sorts introduced at this time, are still grown in American gardens.

Of the several famous English seed houses which sought to popularize the new peas of these breeders and contribute new sorts of their own breeding perhaps the firm of Sutton & Sons did most. Mr. Martin Y. Sutton, speaking in 1897, records that the chief objects in mind in the breeding work carried on by his firm were to replace the small hard round-seeded tall-growing sorts with peas of dwarf growth which would produce large pods filled with wrinkled peas, having the marrowfat flavor. Of the many admirable peas sent out by this firm Sutton Excelsior and Magnum Bonum were best known in the United States and are still largely grown many decades after their introduction.

Carter & Company and Hurst & Company, other English seedsmen known the world over, helped to distribute these noteworthy varieties from the hands of the English breeders and contributed sorts of their own to the trade. A full history of the pea could not be written without devoting more than one page to the plant improvers named and to seedsmen who by hybridization and selection have so vastly improved the pea.

Peas were brought at an early date into the New World as may be seen from the following references cited by Sturtevant.

"Peas were early introduced to the American Continent, but, in notices of this plant, the word *peason* refers sometimes, it is probable, to beans. In 1493, *peason* are mentioned by Peter Martyr as grown at Isabella Island by Columbus; in 1535, *peason* are mentioned by Cartier as grown by the Indians of Hochelaga, now Montreal; and in 1613, peas were obtained from the French traders grown by the Indians of the Ottawa River; in 1540, peas are mentioned in New Mexico by Alarcon and 'small, white peas' by Coronado; in 1562, *peason* were cultivated by the Florida Indians, as related by Ribault. In 1602, peas were

sown by Gosnold on the Elizabeth Islands off the coast of Massachusetts, according to Smith; in 1629, in Massachusetts, there was a 'store of green peas,' 'as good as ever I eat in England,' growing in the governor's garden, according to Rev. Francis Higginson. In 1614, peas were mentioned by Smith as grown by the New England Indians. In 1690, Bancroft says Spanish peas were grown by the Indians of Mexico, and in 1775, Romans says green peas were obtained the year round at Mobile, Alabama. In 1779, Gen. Sullivan's expedition against the Indians of western New York destroyed the growing peas of the Indians who occupied the territory near Geneva."

Most of the peas grown in America are varieties which originated in England, where, at any rate until recently, pea-breeding has received much more attention than on this side of the Atlantic. Still many admirable varieties are of American origin: as Landreth Extra Early, East Hartford Extra Early, Ferry First and Best, Rural New Yorker, Pedigree Extra Early, Rice Extra Early, Lightning Excelsior, Extra Early Market, Dexter, Maud S., Alaska, Klondike, Winner, Nonpareil, Hustler, Horal, Rice No. 330, American Wonder, Old Glory, New Era, Nott Excelsior, Dwarf Perfection, Dwarf Telephone, Blue Bantam, Surprise, Cannors Gem, Cannors Perfection, Allan Canner, Horsford Market Garden, Admiral Dewey, King of the Dwarfs, Eclipse (wrinkled), Potlatch, and many other varieties of temporary or local distribution.

The histories of these American peas, with others of lesser note, are traced in the discussions of varieties and form an interesting contribution in the history of American vegetables.

This brief sketch of the pea in America should not close without noting the names of some of the men and companies who have been or are now seeking to improve peas: David Landreth, John H. Allan, Chas. Arnold, A. B. Cleveland, Rogers Bros., N. B. Keeney, Wilbur Brotherton, F. H. Horsford, D. M. Ferry, Richard Nott, Geo. Starr, E. J. Delwiche, W. Atlee Burpee, Robt. Buist, Jas. Vick and many too little recognized breeders, selectors and guides in roguing who have been associated with the wholesale growers of seed peas.

To illustrate the advance made in the improvement of the pea since Gerarde's *Herbal* in 1597 the number of varieties listed by garden writers may be given. Gerarde numbered four sorts, all of which probably correspond to groups of modern peas. Parkinson, 1629, names 9 kinds; in 1683, Meager, 9 kinds; in 1765, Stevenson, 34 kinds; in 1778, Mawe, 15 kinds; in 1807, Miller, 17 kinds; in 1859, Thompson, 36; in 1883, Vilmorin, in France, 149. In the United States McMahon in 1806 names 22 kinds; in 1824, Thorburn, 24; in 1863, Burr described 72 kinds; in 1884, the New York Agricultural Experiment Station 93 varieties; in this text more than 1,000 are listed. Of these varieties, 350 are now completely out of cultivation; and 110 have been grown only in tests or to a very limited extent.

CHAPTER II

SYSTEMATIC BOTANY OF PEAS, AND THEIR ALLIES

The leguminous plants, constituting that large and varied assemblage known botanically as the family Papilionaceae, are of prime importance economically as sources of lumber, dyes, forage and food.

The particular group of legumes considered in Part I, the peas and related plants whose seeds, pods, or both are at present of more or less importance as food in the United States, belong almost entirely in a single tribe of this family, the Viciae.

Aside from the peanut, *Arachis hypogaea* L., the food plants of the other tribes except the Phaseoleae, the beans and their allies (which will be discussed in a following part), are unimportant and merit but short notice.

Lotus tetragonolobus L. (Tribe: Loteae). The "asparagus pea" is occasionally cultivated in central Europe and in the Orient. The seeds and pods are eaten green, or the seeds alone are occasionally used dried or roasted. The immature pods of *L. edulis* L. are sometimes used like string beans by the peasants of Crete.

Scorpiurus vermiculata L. (Tribe: Hedysareae). The caterpillar or wormlike pods of this plant are said to be used "in soups as a practical joke, not for their edible qualities." The fruits of *S. subvillosa* L., *S. sulcata* L. and other species are used in the same way.

Arachis L. *Sp. Pl.* 741. 1753. (Tribe: Hedysareae).

Herbs; leaves pinnate with two pairs of leaflets or trifoliate, stipules adnate to the petiole; inflorescences axillary; flowers sessile or short-stalked with two narrow bracts below the calyx; calyx tube long filiform simulating a pedicel, dilated above and campanulate at the insertion of the petals and stamens, teeth 5, the upper 4 united, the lower free; standard orbicular, wings oblong, keel recurved; stamens 9 or 10, all united; ovary at the base of the calyx tube, ovules 2-3, styles filiform.

There are 9 species, natives of tropical South America; the following is now cultivated in all the warmer countries.

A. hypogaea L. *Sp. Pl.* 741. 1753.

Peanut, goober, pindar; Erdnuss (Germ.); arachide, pistache de terre (French); pistacchio di terra (Ital.).

Annual, about 1 foot high, branched from the bottom; leaves paripinnate, with two pairs of obovate entire leaflets; fruit — through the rapid lengthening of the pedicel, which is very short at first — deeply buried and ripening in the soil; seeds ovate, 1-3.

This has become a very important plant. The "nuts" are eaten and sold almost everywhere. An excellent oil is extracted from them which competes successfully with olive oil, as it keeps better and does not darken as readily.

Peanuts are widely cultivated in Asia, especially in China. For some time it was even doubted whether the plant was really a native of America, but it was evidently in cultivation by the Indians before the discovery of America, the nuts having been found in the mummy graves of Peru.

Tribe: VICIEAE Bronn *Diss. Legum.* 133. 1822.

The tribe Viciae, to which the peas and their allies belong, are (excepting the shrubby species of *Abrus*) annual or perennial herbs, erect or vinelike and bearing tendrils or short bristles (setae) at the end of the pinnately compound leaves. The flowers are all somewhat similar to those of peas and 9 of the 10 stamens are united in a tube, the 10th being free or nearly so.

The following key includes those genera of importance as food plants.

KEY TO GENERA OF VICIEAE.

- A. Style glabrous; keel and wings free; staminal tube twice as long as the ovary; pod inflated, containing 2 seeds; filaments dilated above; leaves odd pinnate. 1. *Cicer* (p. 10)
- AA. Style hairy; pod not inflated; leaves paripinnate.
- B. Staminal tube obliquely truncate.
- C. Calyx with 5 teeth; style filiform, hairy above; pod with two to several seeds; wings coherent with the keel. 2. *Vicia* (p. 11)
- CC. Calyx 5-parted; style flat, a line of hairs on the inner side; pod rhomboid, with 1-2 seeds. 3. *Lens* (p. 12)
- BB. Staminal tube horizontally truncate.
- C. Style dilated or flattened, hairy along the inner side; wings nearly free. 4. *Lathyrus* (p. 12)
- CC. Style canaliculate and bearded along the inner side. 5. *Pisum* (p. 13)

I. CICER [Tourn.] L. *Sp. Pl.* 738. 1753.

Plants herbaceous or suffrutescent, frequently glandular hairy; leaves either ending in a bristle or tendril or odd pinnate, leaflets mostly dentate; stipules oblique, dentate; peduncles axillary; flowers single or a few in a raceme, bracts small; calyx with 5 subequal teeth; standard ovate or orbicular, narrowed into a short broad claw; wings obliquely obovate, keel curved, obtuse or somewhat pointed; ovary sessile, ovules 2 or more; pod ovate or oblong; the seeds globular or angular.

This genus comprises about 14 species, all natives of western Asia and southern Europe, of which only the following is of importance as a food plant.

Cicer arietinum L. *Sp. Pl.* 738. 1753.

Chick pea; Kichererbse (Germ.); pois-chiche, pois tete de belier, pois cornu, pois becu, garvance (French); cece (Ital.); cicer (Rum.); garbanzo (Span.).

Annual herb, 20-40 cm high, erect or ascending, branching from the base or in the upper part, glandular hairy throughout; leaves short stalked; leaflets mostly in 6-8 pairs — usually not opposite, oval to oblong, sharply serrate toward the tip, 8-15 mm long; stipules semi-sagittate, with 2-5 deltoid teeth; peduncles much shorter than the leaf, 1-flowered, articulate in the middle and with a subulate bract; flowers about 1 cm long, purplish or pale violet or white; calyx with narrow lanceolate acuminate teeth exceeding the tube; standard with darker veins; pods on decurved pedicels, oblong-ovate, gibbous, ending in a curved beak, viscid-glandular, 15-20 mm long; seeds obovate or roundish with a short nearly straight beak.

There are several varieties, probably forming two distinct races. The plants of the first race have violet flowers; here belong the following varieties:

- 1) var. *vulgare* Jaub. & Spach. *III. Pl. Orient.* 1:83. 1842.—
- var. *nigrum* Alef. *Oester. Bot. Zeits.* 9:356. 1859. *C. nigrum* Hort. ex Alef. *l. c.*

Seeds black, impressed at the hilum. This is said to be the wild form.

2) var. *fuscum* Alef. *Bonplandia*. 9:67. 1861.

Seeds rather small, reddish brown, much impressed.

3) var. *rhytidospermum* Jaub. & Spach. *Ill. Pl. Orient.* 1:83. 1842.—var. *cruentum* Alef. *Bonplandia*. 9:67. 1861.

Seeds blood red, almost globular.

The plants of the second race have white flowers; here belong the following varieties:

4) var. *sativum* Beck. in Reichb. *Ic. Pl. Germ.* 22:207. 1903.—*Cicer sativum* Schk. *Hdb.* 2:367. 1796. *C. arietinum* var. *macrocarpum* Jaub. & Spach. *Ann. Sc. Nat.* II. 18:226. 1842. var. *album* Alef. *Oester. Bot. Ztg.* 9:356. 1859. *C. album* Hort., ex. Alef. *l.c.*

Pods attenuate near the base; seeds white, slightly impressed.

5) var. *globosum* Alef. *Oester. Bot. Zeits.* 9:356. 1859.—*C. rotundum* Jord. *fide* Alef. *l.c.*

Seeds orange yellow, almost globular.

Possibly native of western Asia; since remote times cultivated in all countries bordering the Mediterranean, in northern Africa as far south as Abyssinia; in Europe especially in Spain, southern France and Italy; and in America in all the old Spanish settlements; often escaped from cultivation and occurring as a weed in fields.

It seems that Cicer was known to the Phoenicians and through them came to Greece, Italy, and Spain; there is no indication, however, that it was cultivated in ancient Egypt, nor has it been found in the remains of prehistoric lake dwellings in Switzerland or elsewhere, like the pea and the lentil.

The plant is glandular viscid all over and contains oxalic acid. It is used in southern Europe to poison fish.

The seeds of Cicer are farinaceous and somewhat bitter; they are eaten boiled, roasted, or ground as flour for puddings and cakes or for thickening soups. They are especially esteemed in Spain and the Spanish settlements.

In India the secretions of the plants are collected by spreading a cloth over them during the night, and the liquid thus obtained is used as vinegar or for forming a cooling drink.

2. VICIA [Tourn.] L. *Sp. Pl.* 734. 1753.

Erect, climbing or procumbent herbs, with leaves mostly ending in tendrils; flowers axillary or in peduncled one-sided racemes, varying from white to yellowish, pink, purplish or blue; calyx tube oblique at the base, teeth almost equal; petals mostly with a short claw, standard obovate and notched, wings obliquely oblong, keel attached to their middle, shorter, curved; ovary with two to many ovules; seeds various, globular to ovate or \pm compressed.

There are about 150 species, natives of the north temperate zone, a few also in South America. The only important species cultivated as a vegetable is the Broad bean — *Vicia Faba*.

Vicia Faba L. *Sp. Pl.* 737. 1753.—*Faba vulgaris* Moench, *Meth.* 150. 1794. *Faba Faba* (L.) House, N. Y. State Mus. Bull. No. 254. 457. 1924. Broad

bean, Windsor bean, English dwarf bean, horse bean; Puffbohne, Dicke-bohne, Saubohne, Pferdebohne (German); fava (Italian); feve, feverole (French).

Annual herb, with erect, robust and fleshy 4-angled stem, glabrous throughout; stipules semi-sagittate, dentate, with a round dark spot; the leaf rachis ending in a short point; leaflets in 1-3 pairs, not always opposite, ovate, obtuse, with a short point, somewhat fleshy and glaucous; flowers 3-6 in short stalked racemes or clusters; pedicels short; calyx tubular, the teeth lanceolate, acute, less than half as long as the tube; standard obcordate, whitish, with purplish veins; wings shorter, with a long claw, white with a large round blackish spot; keel blunt, greenish, with a long claw; style bearded below the stigma; pod large and thick, broader near the end, swollen around the seeds, from 6-15 cm long, puberulous, at length becoming black; seeds 2-5, large and flat, imbedded in the spongy, soft inner coat and separated by spongy divisions; dull when ripe, mostly leather-colored or green to red brown, self-colored or spotted, with a large dark oblong hilum.

Native country not known, probably the regions around the Caspian Sea according to DeCandolle and others.

There are three varieties recognized:

1) var. *minor* Peterm. *Fl. Lips.* 549. 1838.

Pods thin, terete; seeds 3-4, roundish, 10-13 mm long.

2) var. *equina* Pers. *Syn.* 2:308. 1807.—*V. Faba* var. β L. *Sp. Pl.* 737. 1753. *Faba equina* Medic., *Vol. Ch. Phys. Ges.* 2:360. 1787.

Pod thin, terete; seeds 4-5, thick especially near the hilum, oblong, angular.

3) var. *megalosperma* Beck *Fl. Nied-Oester.* 873. 1893.—*Faba vulgaris* var. *megalosperma* Alef. *Bonplandia* 9:101. 1861.

Pods short, broad, somewhat compressed; seeds 25-35 mm long, roundish, compressed and with concave sides, thicker around the hilum.

Alefeld in his *Landwirtschaftliche Flora* (1866) gives a wide range of varieties or variety groups, and enumerates 42 of them to which he gives Latin names. The varieties exhibit differences in size, shape, and color of the seeds, and also in the color of the flowers.

The broad bean is not much cultivated as a vegetable in the United States, and probably never will be. It mildews very badly here.¹ It is, however, much grown in Europe, although it is losing in favor there also, since it cannot compete with the kidney bean and because the plants suffer greatly from aphids.

The broad bean is one of the oldest cultivated plants; seeds found in Swiss lake dwellings have been attributed to the Bronze Age. It was grown by the Greeks, Romans, Hebrews, and Egyptians, and probably by other ancient nations. In Egypt, however, broad beans were considered impure and perhaps were eaten only by the poorer classes. The priests were averse to the beans and did not eat them at all. Broad beans have been known in China and Japan for a long time.

None of the other vetches are important as vegetables though many are excellent forage plants and are

¹ A few varieties, however, are offered occasionally by American seedsmen. Among those tried at this Station or reported as available are the following:

I. Dwarf Fan-podded Types: Early Mazagan, Green Gem, Bell, and another small seeded form incorrectly called Frost Proof Lima.

II. Broad Windsor Types: Colossal, Broad Windsor, Green Windsor, Bacon, and January Bean.

III. Longpod Types: Early Longpod, Prolific, Seville, and Sword.

The reader is referred to the *Journal of the Royal Horticultural Society* 43:160. 1918 for descriptions of nearly 50 varieties and to a later number of the same journal (48:74. 1923) for a much augmented list and a classification of types.

cultivated extensively. The seeds of a few species are or have been used as food occasionally; the more noteworthy being the following:

Vicia Ervilia Willd., a forage plant of the Mediterranean region, the seeds of which may have been eaten but are considered unwholesome by Lewin; *V. monanthos* Desf. and *V. narbonensis* L. also forage plants from the same region are said to have been used occasionally as food; *V. pisiformis* L. known by the French as "lentille du Canada," *V. sativa* L. "tare" or "white vetch," and *V. hirsuta* S. F. Gray are sometimes used like lentils or ground into a flour for various uses.

3. LENS [Tourn.] Moench *Meth.* 131. 1794.

Slender herbs; leaves alternate, usually ending in a tendril; leaflets entire; stipules semi-sagittate; peduncles axillary, flowers small, single or few, racemose; calyx with long subequal teeth; petals similar to those of *Vicia*, the keel, however, acute or somewhat rostrate; ovary subsessile, with 2 ovules; style curved, flat, bearded inside, stigmas small; seeds round, flat.

There are 5-6 species, natives of the Mediterranean and western Asia. The following is of general interest:

Lens esculenta Moench, *Meth.* 131. 1794.—*Ervum Lens* L., *Sp. Pl.* 738. 1753. *Cicer Lens* Willd. *Sp. Pl.* 3: 1114. 1800. *Lens vulgaris* Delarb. *Fl. Auv. ed.* 2. 472. 1800. *Lathyrus Lens* Bernh., *Syst. Verz. Erf.* 248. 1800. *Lens sativa* Hell. *Fl. Wirc.* 2:169. 1810. *Vicia Lens* Coss. & Germ., *Fl. Paris* 143. 1845. *Lathyrus esculentus* Grab. *Fl. Oberschles.* 214. 1843. *Lens Lens* Huth, *Helios.* 11:134. 1893. *Lentilla Lens* W. F. Wright, *Cent. Dict.* 5:3410. 1911. Lentil: Linse (Germ.); lentille (French); lente, lentischia, lentilla (Ital.).

Annual, 10-45 cm high, stem quadangular or almost alate, more or less branched from the base, sparingly hairy throughout; leaves short-stalked, the lower ones with 6, the upper ones with up to 14 leaflets and ending in a single or branched tendril; leaflets short stalked, narrowly elliptical, 1-2 cm long and 3-8 mm or more wide, obtuse, mucronate, green; stipules semi-sagittate, 6 mm long and 2 mm wide; peduncles usually shorter than the leaf, mostly 2-flowered, rarely 1-4 flowered; pedicels 4 mm long; flowers small, nodding, 7 mm long, standard roundish with purplish veins, keel with violet blotched point; calyx teeth narrow, exceeding the petals; pod rhomboid, about 1 cm long and 8 mm wide, somewhat inflated; seeds usually 2, flat, biconvex, with sharp borders, grayish brown, black, yellow, or reddish.

There exist several varieties which seem to belong to two different races. The one race consists of low, hairy, early-flowering plants with bluish green leaves. Here belong the varieties:

- 1) var. *punctatum* Alef. *Bonplandia* 9:130. 1861. Seeds sulphur-yellow with 3-6 black dots.
- 2) var. *hypochloris* Alef. *Bonplandia* 9:130. 1861. Stems green below; seeds grayish brown.
- 3) var. *pilossissima* Schur *Enum. Pl. Transs.* 171. 1866. Plants very hairy.

The plants of the second race grow higher and stouter, are decidedly green, less hairy, and flower later. Here belong the varieties:

- 4) var. *nigra* Alef. *Bonplandia* 9:130. 1861. Standard blue; seeds small, black.

- 5) var. *vulgaris* Gren. & Godr. *Fl. France* 1:476. 1848. Standard blue or white with blue veins; seeds whitish yellow or greenish yellow to brownish. This is the most commonly cultivated variety. In warmer countries this is sown in the fall, since it winters well and yields a large crop of seeds and straw.

- 6) var. *nummularia* Alef. *Bonplandia* 9:130. 1861.—*L. macrosperma* Baumg. *Enum. Pl. Transs.* 2:346. 1816. Seeds large, yellow, red or black. Grown during the summer only.

- 7) var. *disperma* Rouy in Rouy & Foucaud *Fl. France* 4:205. 1899.—*Ervum disperma* Roxb., ex Willd. *Enum. Hort. Berol.* 766. 1809. *Lens esculenta* β *subsphaerosperma* Godr. *Fl. Lorr.* 1:172. 1843. Seeds much smaller, about 1/3 of the type, rounded at the margin, brown and marbled. Much cultivated in France.

The lentil is probably a native of eastern Asia,¹ from Beluchistan and Afghanistan to southern and eastern Persia. It occurs, probably as a subsontaneous plant escaped from cultivation, through northern Africa and the Mediterranean parts of Europe.

The lentil has been in cultivation from very remote times. Lentil seeds were found in the prehistoric dwellings on the Swiss lakes, in Germany at Schussenried, in Switzerland, Italy, and Hungary, and also in the ruins of Troy. It was cultivated to a large extent in Egypt and exported from there to Greece and Rome. According to Schweinfurth, the lentil was originally introduced to Egypt from Mesopotamia.

4. LATHYRUS [Tourn.] L. *Sp. Pl.* 729. 1753.

Low herbs or climbing by branched tendrils; stems often winged; stipules often semi-sagittate; leaves, mostly ending in tendrils; flowers solitary or racemose, frequently large and showy, yellow, white, pink, violet, or blue; bracts small, caducous; calyx oblique, 5-dentate; standard large, erect, more or less orbicular; wings obovate like the obtuse keel, long clawed; ovary with 2 to many ovules; pod straight, compressed or terete; seeds \pm globular or angular, with linear hilum.

About 100 species, mostly inhabiting the Northern Hemisphere, a few extending along the mountains to tropical Africa and South America.

Only the following species has been in general cultivation as a vegetable:

Lathyrus sativus L. *Sp. Pl.* 730. 1753.—*Cicerula sativa* Alef. *Bonplandia* 9:147. 1861.

Ax-vetch, chickling vetch. Deutsche Kicher, Kicherling, Saat-Platterbse, essbare Platterbse, fahnerbse (Germ.); gesse, pois breton, pois carré, garousse (French); Cicerchia bianca, Cesarella (Ital.).

Annual, branching from the base, 30-70 cm high, glabrous; stems with 2 broad decurrent wings and 2 angles; stipules semi-sagittate, rather large, shorter than the petioles, about 2-7 cm long, 4 mm wide; petioles winged, with 1 pair of leaflets, these linear-lanceolate, acuminate, up to 15 cm long and 3-9 mm wide with 3-5 strong veins, somewhat glaucous; peduncles about as long as the petioles, angled, 1-rarely 2-flowered; pedicels equaling the calyx; flowers 1.5-2 cm long; calyx-lobes lanceolate, exceeding the tube; standard whitish and darker veined, pale pink or deep blue; keel greenish white; pod 3 cm long and 1.3 cm broad, compressed with two broad patent wings on the upper (ventral) margin; seeds 2-4 (rarely 1 or 5), up to 12 mm broad and 16 mm long, flat, angular, flattened on one side, almost axe shaped, with a small narrow hilum, smooth, grayish brown, spotted with brown, or entirely white.

¹ Alef. *Lens esculenta* Schnittspahni Alef., a native of Asia Minor, is considered by some to be the source of the cultivated kinds. It scarcely differs from the typical form, except for the blue standard, and white wings and keel. The reddish seeds are minutely and dense spotted. The forms *himalayensis*, *persica*, *indica*, and *abyssinica* are very similar.

Mediterranean region of Europe and Africa, from Spain to Turkey, western and central Asia, often cultivated as a forage plant and sometimes spontaneous.

There are several wild and cultivated varieties. The latter are:

- 1) var. *coeruleus* Asch. & Graebn. *Syn. mitteleurop. Fl.* 6²:1004. 1909.—*Cicerula sativa coerulea* Alef. *Bonplandia* 9:148. 1861. Flower deep blue; seeds densely dark spotted. Cultivated in Abyssinia (Native name "Sebberi"—A. Braun), and as an ornamental plant in Europe.
- 2) var. *coloratus* Ser. in DC. *Prodr.* 2:373. 1825.—*Cicerula sativa colorata* Alef. l. c. Flowers whitish, with blue veins; seeds with bright spots. Cultivated as an ornamental, and for food in Abyssinia.
- 3) var. *albus* Asch. & Graebn. l. c.—*Cicerula sativa alba* Alef. l. c. Flowers and seeds white. Cultivated in Europe.

The "ax-vetch" or "chickling vetch" has been in cultivation since very ancient times. Schweinfurth found seeds of it in Egyptian tombs; large quantities have been found in a cave in Hungary, and also in ancient Troy.

It is now chiefly cultivated for forage. It is said to be superior to the common vetch but less productive. In some parts of Europe, as in France, Silesia, Italy and Spain, and also in Turkey and India, the seeds of the white form are often eaten like green peas or when dry like beans, in soup during the winter. The flour from this vetch makes a pleasant bread, but it is said to be unwholesome unless mixed with 3 parts of wheat or other flour. It is not cultivated in the United States as a food plant. The seeds are inferior to peas in taste, but are rarely infested with insect borers.

Some other species of *Lathyrus* are or have been in use as food plants, and the following merit brief notice:

Lathyrus Aphaca L., "Yellow flowered pea," the young seeds were occasionally eaten in England; the ripe seeds are said to be narcotic and to produce headache; native to southern Europe; *L. Cicera* L., the "lesser chick pea" or "vetch," a native of the Mediterranean region, is sometimes grown for its seeds which are, however, said to be of inferior quality and sometimes unwholesome; *L. maritimus* Bigel., "heath pea," or "seaside pea," the seeds are bitter, but can be eaten and have been used in times of great need in England; *L. montanus* Bernh., "bitter vetch," "heath pea" or "mountain pea," a native of Europe and eastern Asia; the seeds are sometimes eaten; *L. Ochrus* DC., native of the Mediterranean region, it has been cultivated for its peas, and some believe that the peas found in Troy by Dr. Schliemann may have been of this species, though the seeds are bitter and difficult to digest.

5. PISUM [Tourn.] L. *Sp. Pl.* 727. 1753.

Stems slender angular, soft and glabrous, green or more or less glaucous; leaves alternate, distichous, with one or several pairs of leaflets, the rachis ending in a simple or branched tendril or with a very short and rudimentary tendril only; leaflets opposite or

alternate, the lower ones larger; stipules small in the perennial species or larger in the annual species, with the basal part much enlarged, clasping the stem; peduncles axillary, \pm erect, 1-2 or 3 (rarely more) flowered; pedicels erect, patent or nodding, as long as the calyx; calyx obliquely campanulate, with 5 unequal, pointed lobes, the upper ones shorter and broader; standard roundish or broadly obovate, with two gibbous knobs at the base and contracted into a broad claw; wings \pm falcately obovate, longer than the curved keel and adhering to it; ovary almost sessile, with several ovules; style curved, rigid, bearded on the inner side; stigma oblique, terminal; fruit a bivalved, linear, obliquely truncate and rostrate pod, with the calyx persistent at the base; valves generally pergammentaceous when drying, reticulately veined, twisting when opening; seeds several, \pm roundish or globular, smooth or verruculose, yellow, green or brown, unicolorous or spotted.

There are several species, natives of western Asia, the Mediterranean, southern Europe and northern Africa, some of them largely cultivated almost all over the world.

The Index Kewensis lists a great many names, but recognizes only 7 species. Recent authors, however, agree that most of them are but subspecies of *Pisum sativum*.

KEY TO THE SUBSPECIES OF PISUM SATIVUM

- A. Flowers 16-20 mm long.
 - B. Leaves with 1 pair of leaflets only.
 - C. Stipules dentate often up to the top and also along the inner margin; peduncles shorter than the stipules.
 - 1) *Pisum sativum abyssinicum* (p. 16)
 - CC. Stipules dentate only near the base.
 - 2) *Pisum sativum Jomardi* (p. 16)
 - BB. Leaves with 1-3 pairs of leaflets; seeds globular, finely granulate, brown, marbled with green.
 - 3) *Pisum sativum syriacum* (p. 17)
- AA. Flowers larger.
 - B. Flowers colored; seeds \pm brown.
 - C. Stems and stipules not spotted with red; flowers large; seeds almost globular, finely granulate, dotted.
 - 4) *Pisum sativum elatius* (p. 17)
 - CC. Stems and stipules spotted with a red blotch at the node; seeds \pm angular, smooth, often \pm spotted.
 - 5) *Pisum sativum arvense* (p. 17)
 - BB. Flowers white; seeds yellow, yellowish or greenish, globular, or wrinkled and angular.
 - 6) *Pisum sativum hortense* (p. 18)

Alefeld¹ and others believe *Pisum sativum elatius* to be the ancestor of *P. sativum arvense*, and that from the latter *P. sativum hortense* originated. While this may be quite possible, it would seem that *P. sativum arvense* must have existed as a distinct entity contemporaneous with *P. sativum elatius*; and that a similar entity probably existed for *P. sativum hortense*. These, together with other pea entities must have been derived from a common ancestor,² which was very likely a perennial species, perhaps not much unlike the perennial pea, *P. formosum*.³ Each of these entities in spreading over a large geographical area during the course of ages broke up into a considerable number of variously related races.

These races are generally self-fertile and their offspring remain constant, but, doubtless, occasional

¹ Alefeld *Landwirtsch. Fl.* 31, 45. 1866.

² R. H. Lock found in Ceylon a wild pea, which he considered to be such an old, if not the, architype of the peas (*Proc. Roy. Soc. Lond. B.* 79. 28-34. 1907). There is, however, little evidence that *Pisum* can be a native of Ceylon. It is not known whether it is identical with *Pisum sativum zeylanicum* Alef. *Landwirtsch. Fl.* 45.

³ *Pisum formosum* (Stev.) Alef. *Bonplandia* 9:237. 1861. A perennial herb from eastern Asia, not introduced into cultivation.

crosses between such races occurred spontaneously through the agency of insects. The individual races are separated by slight and often variable characters. The species, subspecies, or varieties which we more or less arbitrarily adopt for our convenience are composed of many such races. If extreme forms are singled out, it seems as if they could be considered as sufficiently distinct "species" but as soon as large numbers of specimens are taken into consideration no single character proves constant and the supposed "species" may be segregated into an almost endless number of smaller races or strains. S. T. Wellensick¹ admits concerning *P. sativum hortense*, *P. sativum arvense*, *P. sativum elatius*, and *P. sativum Jomardii* that there "are at least 500 constant strains, which after crossing (so far as they have been studied) produce invariably fertile hybrids. As recombinations are continually being produced by crossing, it is evident that a division of the genus *Pisum* into a small number of species cannot stand the test of time. Therefore it would seem a rational procedure to combine into one species all the cultivated forms of *Pisum* that are mutually crossable."

This was first done by Alefeld (*Landwirtsch. Flora* 1866), who, however, gave Latin varietal names to all the 102 wild and cultivated varieties or races known to him. Ascherson & Graebener admit as subspecies *P. sativum elatius*, *P. sativum arvense*, and *P. sativum hortense*. There are, however, as is evident from what was said above, no clear differences between subspecies and it is not always easy to say with which subspecies a given individual plant should be classified. *P. sativum elatius* sometimes closely resembles *P. sativum arvense*; *P. sativum Jomardii* seems to come very near to *P. sativum abyssinicum*; and *P. sativum syriacum* approaches *P. sativum elatius*.

Pisum fulvum is the only one of all the annual peas, so far known, that has sufficiently distinct characters to admit it to the rank of a species.

Western Asia, from Syria and Asia Minor to the east, is the region where most of the forms of *Pisum* are to be found in a spontaneous, subspontaneous or cultivated state. *P. sativum elatius* has extended westward spontaneously into the Mediterranean region and southern Europe, and *P. sativum arvense* exists in Italy as a wild, not as an escaped plant.

The germination of the pea is subterraneous, the cotyledons remain included in the seed coat, which opens only enough to allow the young root and stem to grow. The root immediately sends out numerous smaller lateral rootlets. The stem is almost terete at first and bears two rudimentary or primary leaves, of which the first one is subterraneous. The second leaf covers and protects the stem at the curved point with which the plantlet penetrates the soil. These first rudimentary leaves show clearly two lateral ovoid blades, corresponding to the stipules, and a narrower middle part, sometimes with a very small hooked point,

evidently representing the petiole, rhachis, and tendril of the later perfect leaves. In many cases, later on, a lateral stem is produced from the axil of the upper rudimentary leaf.

With the appearance of the leaves the stems become 4-angled. Two of the angles run down from the midribs of the two stipules and one from the petiole. The angle of the latter covers two internodes. The stems are weak, soft, and hollow inside, and the internodes are more or less flexuous.

The leaves are distichous and alternate, i. e., they stand in two opposite rows, one above the other. Stipules are always present. In *Pisum formosum*, the only perennial pea extant, so far as we know, they are small. In the annual peas, subgenus *Lophotropis*, however, the stipules are much larger from the beginning; and though comparatively smaller on the lower leaves they reach a considerable size on the upper part of the stem and exceed the leaflets. The stipules are clasping, obliquely attached, the lower part often overlapping, and the outer margin dentate, at least near the base. The stipules form an excellent protection for the tender growing points of the plant and the young flower buds. In *Pisum sativum hortense* they are usually rounded at the top with a small cusp, while in *P. sativum arvense* they are usually more pointed.

In *Pisum formosum*, the petioles are channeled on the upper side, have one pair of leaflets and terminate in a small cusp representing a primitive tendril. The channeled petioles and the small stipules seem to be very old characters, which in *P. formosum* remain constant while in the annual peas, these characters are observed only in juvenile plants and in the lower leaves which have a distinctly channeled petiole, a little longer than the small stipules and one pair of opposite, entire, or indistinctly toothed leaflets, usually notched and with the midrib mostly protruding into a small cusp. The petiole ends in a short primitive tendril, a few millimeters long, much resembling that of *P. formosum*. At about the 3rd or 4th leaf the tendril begins to lengthen and branch into 1-3 pairs of lateral branchlets; and, at the same time, the petioles become terete or almost so. Very rarely the tendril is not developed at all, as in the case of the remarkable variety "Acacia." This has four pairs of leaflets and a terminal odd leaflet, but no trace of a tendril. Rudimentary tendrils and channeled petioles, however, are found on the lowest two leaflets.

The upper leaves of the annual peas are composed of 1-4 pairs of leaflets, which are rarely exactly opposite. They are rather uniform in shape, in most species, the lower leaflets the larger and the upper ones decreasing in size. They, like the whole plant, are soft, succulent, and more or less glaucous. The leaflets are folded or plicate in the bud. The margins may be entire or especially in the lower leaves, dentate.

On the plants belonging to the subspecies *arvense* the internodes or points of attachment of the stipules

S. T. Wellensick, *Genetic monograph on Pisum (Bibliographica genetica, 2:343-476. 1925).*



White flowers and forming pods

LINCOLN

(Two-thirds natural size)



Roundel flowers and colored stem nodes

SUGAR

(Two-thirds natural size)

and leaves are marked by a narrow blotch of red. The red color sometimes extends to the back of the petioles, the angles of the stem, and to the points of attachment of the leaflets and their margins. This red blotch is an excellent and constant character of *arvense* and some of its allies. On dried specimens, however, it is not always obvious.

The flowers appear with rather great regularity at the same internode in a given strain. In many varieties the first flower arises from the sixth leaf, rarely lower down, in others the first flower comes from a higher leaf. Flowers are then produced from every subsequent leaf-axil.

The peduncles arise from the axil of the leaf between the stem and petiole. They are terete, hollow, and variable in length. At the time when the flowers open they are often scarcely longer than the stipules, but often continue to grow until they may greatly exceed the stipules. But the length of the peduncle offers little as a specific character, except in a few cases.

There may be 1-3 flowers, or in the case of the Scottish or tufted Pea (*Pisum sativum arvense umbellatum* and *Pisum sativum hortense coronatum*) which merely represents fasciation of the stem, as many as 4-5 flowers are produced on a single peduncle. The number of flowers, however, is not always characteristic, peduncles with 1 flower and others with 2 flowers may be found on the same plant, or a second flower may be found in a rudimentary state. Where one flower is produced the peduncle is prolonged into a kind of beak, often as long as the pedicel. This beak is the blind end of the peduncle, not a bract. Bracts are usually missing at the articulated base of the pedicel, though very small or obscure ones may be observed.

When two flowers are developed on a peduncle there can be no beak at the lower flower, but the peduncle is prolonged and ends with a second pedicel, at the base of which a beak and, usually, bracts can be found. These bracts vary greatly in shape and size. They may be subulate or larger and somewhat foliaceous, roundish or ovate, entire or toothed, and about up to 1 cm long, or they may be small and divided in various ways in the manner of the first rudimentary leaves on the germinating stem, or they may resemble two minute stipules.

The flowers of the peas have a peculiar shape, familiar to everybody and characteristic of a large number of plants, the family of the Papilionaceae or Fabaceae, popularly known as the Pea Family.

First of all the pea flowers are zygomorphic, i. e., they can be divided by only one line into two corresponding or symmetrical parts. The calyx is green, foliaceous with a short green tube, somewhat oblique at the base, its 5 lobes, each with a deep green midrib, longer than the tube, and bilabiate. The upper lip consists of two larger, broader, and somewhat recurved lobes, while the lower lip is formed by three narrower and more acuminate lobes which point forward. The upper two lobes back the upper larger petal, the vexillum or standard, while the three lower calyx lobes subtend the wing

and keel petals. In bud the calyx lobes are arranged so that the upper two touch each other with their inner margins, while their outer or lower margins are covered by the two lateral lobes which in turn are subtended on their lower or inner margins by the lower and outermost fifth lobe.

There are 5 clawed petals placed alternate to the calyx lobes. The uppermost, the "standard" or "vexillum," is the largest. It is usually semicircular in outline, attached between the two upper calyx lobes. It is notched at the top in the middle and plicate or furrowed inside from the notch to the base and correspondingly keeled at the back. It is usually variously colored and finely veined, but in *Pisum sativum hortense*, it is pure white with fine green veins, and greenish towards the base. In bud the standard is folded and covers all the other petals. The base of the standard follows the direction of the calyx tube, but is then strongly bent upward. At this point the standard is thickened by two corresponding green callous crests inside which help to stiffen the petal and form an entrance to the honey chamber. These crests fit into depressions on each of the next two petals.

These next two petals are called the "wings." Each has a narrow claw and is abruptly broadened above it, and has there the depression into which the crest of the standard fits, as was just mentioned. These depressions, however, are only the back of prominent knobs on the inner side, which in their turn are tightly fixed in depressions of the following lower petals. The blade of the wings is roundish and much smaller than the standard. In color the wings are also often different from the latter. The wing petals enclose the next two.

These two last and lowest petals, "the keel" of the pea-flower, are grown together except at the base or claw. They form a kind of a hood or little boat which conceals the pistil with the style and the stamens. The suture of the two petals is sharp and somewhat winged like a keel. It is curved upward and ends in a rather acute point. At their base above the claw there are two deep holes into which the knobs of the wings tightly fit. This rather complex structure is much the same in most flowers of the Pea Family, and is correlated with the manner of cross pollination, which is mostly effected by bees and similar insects.

Within the petals are the stamens and the pistil. The lower part of the stamens is united into a kind of tube around the pistil and almost as long as this. This tube is split at the top lengthwise, as only 9 out of the 10 stamens are united, the upper (10th) being free down to its base. The free ends of the filaments are bent upward and densely packed together with the style in the pointed top of the keel.

The pistil rises from the middle of the bottom of the calyx tube. At its base it is contracted into a stalk, then it is laterally compressed, obliquely lanceolate, the lower side usually straight, and the upper one more curved. It is formed by one carpel, the margins of which meet on the upper or inner side of the flower

and bear there the ovules alternately attached to the two placentas.

At the tip the pistil is acute and terminates in the style, which is bent at a right angle, somewhat compressed or flattened and recurved toward the tip. Below the yellow stigma, on the inner side, there are a quantity of white hairs forming a brush to collect the pollen.

If one presses the keel of a pea flower downward the stigma emerges from the keel and with it the pollen is brushed out abundantly. There is, however, some resistance of the keel to overcome and all students agree that pea flowers are very seldom visited by insects and that they are self fertile. The pollen is shed very early in the bud and comes immediately in close contact with the stigma and impregnates it. Nevertheless some rare cases of cross pollination have been observed.

After pollination the pistil soon begins to grow. The calyx is persistent.

In ripening the pod becomes papery and dry, and if left alone, it splits along the sutures, twists lengthwise and exposes and disperses the seeds.

The seeds vary in size, shape, and color according to species and variety, as will be seen in the descriptions of the varieties.

Pisum sativum L. *Sp. Pl.* 727. 1753.

Stems rather robust, 0.30–1.00 m and more high; stipules large, semi-cordate, auriculate, more or less dentate on the outer side of the basal lobe; leaves pinnate, with 1–3 pairs of leaflets or rarely more, usually ending in a simple or pinnately branched tendril, pairs of leaflets not always opposite, leaflets entire or dentate, mucronate; peduncles of various lengths, usually exceeding the stipules, 1–3 or more flowered; flowers 15–30 mm long; standard broad semiorbicular, notched at the top, at the base contracted into a claw, wings obliquely roundish, suddenly contracted into the claw, keel winged; pod 5–10 cm long or more; seeds several, globular or angular, greenish or yellowish or variously colored, with a narrow oval hilum.

This species is composed of the following subspecies:

1. *Pisum sativum* subsp. *abyssinicum* (A. Braun) Alef. *Landw. Fl.* 43. 1866.—*P. abyssinicum* A. Braun *Flora* 24:269. 1841.

Scarcely exceeding 45 cm (1½ feet); stipules 4–5 cm long, almost as long as the internodes, ovate, obtuse, mucronulate, with semi-cordate, ± acute basal lobes, irregularly dentate almost to the top on the inner and outer margin, but the teeth longer in the lower outer half; petioles a little longer, with 1 pair of leaflets and branched tendrils; leaflets ovate, elliptical, or obovate, obtuse, mucronulate, sharply or incisedly dentate except in the somewhat cuneate lower third, 3–4 cm long; peduncles ½–¾ as long as the stipules, but in fruit as long or just exceeding the stipules, 1 flowered; flowers small [?]; of those of subsp. *arvense* or *hortense*, pale; calyx lobes narrow-lanceolate; standard only half open, whitish; wings shorter, bright or pale purple-red; keel shorter than the wings, narrow; pods 4.5–5 cm long; seeds 5–6, small, globular-cubic, brownish red, smooth and shining in Abyssinian specimens, or more grayish brown or grayish green and less shining in cultivated specimens.

Abyssinia, cultivated on the mountains near Djeladjerranne (Wilh. Schimper, No. 1886—*Fl. and Frtg.* Oct. 23. 1840.) Native name: "Ein Ater."

This seems to represent a rather outstanding subspecies or variety, although it is known only from culti-

vated specimens. Its most prominent features are the strongly dentate stipules, the leaves composed of only one pair of leaflets, the short peduncles, and the rather small flowers. It seems to stand nearer to *P. sativum elatius* than to any other. The dried pods on herbarium specimens are of a dull dark purplish color.

It was first grown in 1840 in the Botanic Garden at Karlsruhe-Baden by A. Braun from seeds sent by Wilhelm Schimper from Abyssinia.

Seeds of a pea from Palestine,¹ with which Mr. A. W. Sutton experimented, were presented by him to this Station. However, but three of them germinated and only one grew into a weak plantlet, producing one small flower of an indistinct color. According to Mr. Sutton the flowers are "self-colored of a shade much resembling magenta." He further notes that the plants had "no colour whatever in the axils of the leaves or stems of the plants. Another striking character was that the pods of the Palestine pea were lined inside with a white woolly substance similar to that found in the pods of Broad Beans, but never seen, so far as I am aware, in any other variety of Pea." This pea is further described as of slender growth, without colored nodes, with flowers and pods singly or in pairs, with olive-green seeds, mottled with brown and no black hilum. From the dentate stipules (dentate also along the inner margin) and from the seeds, it seems as if this plant will prove referable to *Pisum sativum abyssinicum*, rather than to *P. sativum syriacum* (*P. humile* Boiss. & Noë).

2. *Pisum sativum* subsp. *Jomardi* (Schrank) Alef., *Landw. Fl.* 43. 1866. as to name only.—*P. Jomardi* Schrank, in *Bot. Zeit. Regenst.* 4:309. 1805.

Plant weak and low, reaching scarcely 45 cm, glaucous, stems angular, little branched; stipules dentate at the basal lobe; petioles terete, leaflets in one pair, ovate, emarginate or obtuse, mucronate, the uppermost faintly fimbriate; peduncles 4 angled, 1- rarely 3-flowered; flowers white, wings faintly rose-colored.

Egypt, collected by Mr. Jomard. According to him the native name is "Guilban" or "Djulban."

We have not seen any specimen of this little pea; it is known only from Schrank's very poor description from which we give a free translation. Pod and seeds were not described by Schrank.

There occurs in trade a form of the field pea under the name of *Pisum Jomardi* Hort., which was described by Alefeld (*l.c.*) as *P. sativum Jomardi*. We grew plants from seeds received from Messrs. Haage & Schmidt under this name. They were quite different from Schrank's *P. Jomardi*.

In his description of *Pisum abyssinicum* A. Braun (*Flora* 24:269. 1841) mentions a *P. Jomardi* and states the color of the flowers and of the seeds; from these notes it is evident that he had before him Alefeld's plant, a field pea, and not Schrank's type, with white flowers and only 1 pair of leaflets.

Schrank says that the plant cannot be recommended for cultivation. It seems to come near to *Pisum abyssinicum*.

¹—W. Sutton, Results obtained by crossing a wild pea from Palestine with commercial types. *Jour. Linn. Soc. Bot.* 12:427–433, *Pl.* 15–17. 1914.

3. *Pisum sativum* subsp. *syriacum* Berger nom. nov.—*P. humile* Boiss. & Noë, *Diagn.* II 2:45. 1856. Not *P. humile* Mill. *Gard. Dict.* ed. 8. No. 2. 1768.

Annual herb, 30–40 cm high, branched from the base, slightly glaucous; stems flexuous, comparatively robust; stipules semi-ovate, semi-cordate at the base, with several deltoid, unequal teeth on the outer margin of the \pm pointed basal lobe, shortly acuminate, mucronate, the largest about 4 cm long; petiole exceeding the stipules, with 1, 2, or 3 pairs of leaflets, ending in a 3- or 5-branched tendril; leaflets ovate or ovate-oblong, broader at the base, obtuse but rarely rounded, shortly mucronate, entire or the lower ones toothed, 20–25 cm long; peduncles 1–2 flowered, longer than the stipules; pedicels about as long as the calyx; flowers medium sized, 16–20 mm long; calyx lobes slightly exceeding the tube; standard notched, pale lilac, wings purplish, longer than the keel; pods straight; seeds “globular, brown, marbled with green, finely granulate.”

Armenia, northern Syria, Mesopotamia, etc., on rocky soil.

This comes nearer to *Pisum sativum elatius* and *P. sativum arvense* than to *P. fulvum*, but it is lower, has smaller flowers, the leaflets entire, and differently colored seeds.

4. *Pisum sativum* subsp. *elatius* (Stev.) Alef. *Landw. Fl.* 44. 1866.—*P. elatius* Stev. in Marsch.-Bieb., *Fl. Taur.* 2:151. 1808. *P. elatum* Ser. in DC. *Prodr.* 2:368. 1825. *P. variegatum* Presl. *Fl. Sic.* 1:13. 1826. *P. arvense variegatum* Guss. *Fl. Sic. Syn.* 2:279. 1843. *P. Tuffetii* Less. *Fl. Rochef.* 170. 1835. *P. granulatum* Lloyd *Fl. Loir.* 75. 1844.

Stems robust, 0.50–1.20 m high, more or less glaucous; stipules 4–6 cm long, half-ovate, obtuse or pointed, basal lobes rounded and sometimes overlapping, on the outer margin sharply and irregularly toothed, teeth deltoid, unspotted; petioles longer than the stipules, with 2 or usually 3 pairs of leaflets; leaflets ovate elliptical, obtuse or truncate, mucronate, mostly with a few remote and shallow irregular teeth, 2–4.5 cm long; peduncles exceeding the petioles, sometimes as long as the leaf or longer, 1–3 flowered; flowers large, 3 cm long; standard broadly orbicular, deeply notched, pale lilac to violet-rose colored with somewhat darker veins; wings dark purple or blackish-purple; keel pinkish or greenish; pod linear, slightly curved or straight up to 10 cm long and 1.5 cm broad, blackish; seeds remote, almost globular, finely verruculose, brown or black, or marbled with darker spots.

From the Mediterranean region to Asia Minor, the Caucasus, Syria, Persia, as far east as the Himalaya and Tibet (Prov. of Ladak), and northern Africa, generally in woods, on meadows, in hedges, etc., and usually not on fields.

Rather variable. The following forms are mentioned:

a.) Forma *biflorum* Asch. & Graebn. *Syn. Mitteleurop. Fl.* 6²:1065. 1910.—*P. biflorum* Raf. *Caratt.* 71. 1810. *P. elatius leiospermum* Rouy & Fouc. *Fl. France* 5:282. 1899.

Seeds quite smooth, mostly greenish, marbled with brown and with fine black stripes.

This form occurs in southern Tyrol and in Istria. A further particular white-flowered form of this is: forma *albiflora* Beck, which appeared in cultivation.

b.) Forma *Sanctae-Notburgae* Asch. & Graebn. *Syn. Mitteleurop. Fl.* 6²:1065. 1910.—*P. biflorum* var. *Sanctae-Notburgae* Pfaff & Murr. *Alleg. Bot. Zeits.* 13:24. 1907.

Leaflets in 2–3 pairs, peduncles 1-flowered; seeds somewhat flattened by pressure, smooth, not striped. Has also been observed in Tyrol and Istria.

Pisum sativum elatius is a robust plant, with wiry stems, and internodes often 10–12 cm long. The leaflets, though sometimes quite entire, almost always show a few dentate. The flowers are large and showy but variable in color. The peduncles usually, but not always, greatly exceed the stipules.

5. *Pisum sativum* subsp. *arvense* Poir. *Encycl.* 5:456. 1804.—*P. arvense* L., *Sp. Pl.* 727. 1753. *P. sativum speciosum* Alef. *Landw. Fl.* 41. 1866 partly.¹

Field Pea. Stems robust, 30–90 cm long or more; stipules large, oblong, often somewhat pointed, with the basal lobes variously rounded or acutish, overlapping or not, irregularly dentate on the outer side of the base, and with a purple blotch around the stem, up to about 5 cm long; petiole with 2–3 pairs of leaflets; leaflets \pm elliptical or ovate-elliptical, usually broader near the base and narrowed towards the top, obtuse or somewhat pointed, mucronate often but not always remotely and shallowly dentate, up to about 4.5 cm long; peduncles variable in length sometimes not exceeding the stipules, 1–2 (occasionally 3) flowered; flowers large, standard whitish, bluish, or purplish, with violet veins, greenish below; wings deep purple; keel greenish; pod up to 10 cm long or more; seeds angular, brown or dark spotted, smooth.

Europe as far north as Scandinavia and through Russia, and probably through northern Asia; spontaneously or as a weed on fields, often as an escape from cultivation. Cultivated in all this area and also in tropical Africa (specimens from Uganda, Lake Edward, in Herb. Kew.)

Of the many varieties recorded the following seem to be the most important ones:

5a.) var. *quadratum* Asch. & Graebn. *Syn. Mitteleurop. Fl.* 6²:1066. 1910.—*Pisum vulgare arvense* β *quadratum* Miller; F. A. Schwarz *Fl. Nürnberg.-Erl.* 2:207. 1899; ? *P. borussicum* Hort., ex Steud. *Nomencl. ed. 2.* 2:345. 1841; ? *P. sativum borussicum* Alef. *Landw. Fl.* 49. 1866; ? *P. bunctatum* Hort.

Plants tall and robust; stipules large, obtuse, serrate in the lower third; leaflets in 2(–3) pairs, remote, large, ovate, truncate or emarginate; seeds large, cubical or almost globular, yellowish brown, grey, greenish, yellowish, or densely marbled with darker blotches, often almost black when old.

5b.) var. *leptolobum* Asch. & Graebn. *Syn. Mitteleurop. Fl.* 6²:1066. 1910.—*Pisum vulgare arvense* α *leptolobum* F. A. Schwarz *Fl. Nürnberg.-Erl.* 2:207. 1899.—*P. leptolobum* Camer. ex Rehb. *Fl. Germ. Ex.* 533. 1832; *P. sativum capucinatorum* Alef. *Landw. Fl.* 42. 1866. “sugar pea.” “Sichelerbse, Zuckererbse” (Germ.).

Rather tall; leaflets in 2–3 pairs; pods falcate, tender and sweet without parchment-like lining; seeds brownish or greenish gray and spotted.

Here belongs part of Sturtevant's *Pisum macrocarpon* (*Rept. N. Y. Agr. Expt. Sta. Geneva N. Y.* 3:238.) 1885, i.e. those with colored flowers and dark seeds.

There exist dwarf forms with closely approximate leaflets.

¹ The following are probably forms of *P. sativum arvense*: *P. sativum* var. *serratum* Alef. *Landw. Fl.* 41. 1866. Weak, at most 2 feet high; lower leaves with 1 pair, upper ones with 2 pairs of leaflets, each leaflet with 6–7 sharp lateral teeth, the largest leaflets about 18 mm long and 8 mm wide; flowers and fruit not known. India; Ganges valley, leg. Schlagintweit.—*P. sativum subefoliatum* Alef. *l.c.* 41, seems to be a strange small leaved form. It was collected by Schlagintweit in Tibet near Leh, Prov. of Ladak.—Besides these and many others Alefeld (*l.c.* 42) describes a *P. sativum smyrnense*, said to be 6–7 feet tall, with deep purple flowers and dark blood red seeds with a black hilum.

5c.) var. *hibernicum* Asch. & Graebn. *Syn. Mitteleurop. Fl.* 6²:1066. 1910.—*Pisum vulgare arvense hibernicum* A. F. Schwarz *Fl. Nürnberg.-Erl.* 2:207. 1899. *P. sativum hibernicum* Alef. *Landw. Fl.* 44. 1866. "Graue Winter-Futtererbse" (Germ.).

Plants more slender than var. *quadratum*; stipules medium sized, sometimes serrate above the base; leaflets in two pairs, ovate to ovate-lanceolate; seeds rather small, red brown, unicolored or marbled, almost globular or slightly compressed.

Cultivated in Bavaria, etc.; it is sown in the fall and harvested in the following year.

Pisum vernale Hort. grown by Haage & Schmidt, is similar, but the seeds are rather smaller. It is sown in spring: "Graue Frühljahrs-Futtererbse" or "Peluschke."

A subumbellate flowered form caused by the fasciation of the stems has been known for a long time and seems to come constant from seeds. It is known as:

5d.) var. *umbellatum* Berger, comb. nov.—*P. sativum* δ *umbellatum* L. *Sp. Pl.* 2 ed. 1027. 1763. "Mummy Pea" "Buschel-Trauben Erbse" (Germ.).

Flowers subumbellate, 4–5 or more together; standard rose-colored, wings deep purple; seeds chestnut brown, large, round.

There is a good figure of this (or of *Pisum sativum hortense coronatum*) in Parkinson, *Parad.* 523. f. 4 (1629) as "*Pisum umbellatum sive roseum*, Scottish or Tufted or Rose Pease."

From India, Tibet, and China. A dwarf and slender stemmed pea with colored flowers, short pods, and brown seeds is found cultivated which may be a distinct race or variety. The red markings on the stipules and stems are not now visible on herbarium specimens but it seems to belong to the field pea.

The field pea can in most cases easily be recognized by its colored flowers, the red blotch around the stem at the insertion of the stipules and by the seeds. Herbarium specimens, when the red blotches become invisible and seeds are missing, cannot always be readily distinguished from those of either *P. sativum elatius* or *P. sativum hortense*.

We have had no opportunity to see specimens of *Pisum ramulare* Morrison ex Reich., *Fl. Germ. Exc.* 532. 1832; it is described as having oblong almost entire stipules, purplish wings and keel, and yellowish green seeds with a black hilum.

Flowers of a *Pisum*, evidently of *P. sativum arvense* are collected in Tibet as a drug (at about 14,000 feet near Yerba Monastery, Herb. Kew.).

6. *Pisum sativum* subsp. *hortense* Asch. & Graebn., *Syn. Mitteleurop. Fl.* 6²:1066. 1910.—*P. sativum* L., *Sp. Pl.* 727. 1753. *P. sativum* var. *hortense* Neill., *Fl. Nied.-Oester.* 964. 1859. *P. sativum* var. *typicum* Beck, *Fl. Nied.-Oester.* 887. 1893.

Garden Pea. Stems robust, 25–90 cm or more, green or glaucous; stipules large and broad with the basal lobes usually rounded and overlapping, about 7 cm long, mostly obtuse, mucronate, irregularly crenate on the outer lower half; petioles stout, with 2–3 pairs of leaflets; leaflets \pm ovate, \pm obtuse, mucronate, entire, 3–5 cm long; peduncles of various length, as long as the petioles or exceeding them, 1–2 flowered; flowers large, petals white, greenish at the base; pod up to 10 cm long or more; seeds smooth, pale yellow or greenish, globular or more or less wrinkled or compressed and angular.

Cultivated everywhere; no undisputably wild plants of it are known. It is cultivated in tropical Africa at Lake Edward in Uganda with the field pea (Herb. Kew.).

There are the following varieties:

6a.) var. *pachylobum* Asch. & Graebn. *Syn. Mitteleurop. Fl.* 6²:1067. 1910.—*P. sativum typicum* forma *pachylobum* Dierb. ex Beck in Reichb. *IC. Fl. Germ.* 22:209. 1903. *P. sativum* β L. *Sp. Pl.* 727. 1753. "Kneifel" or "Pahlerbse" (Germ.).

Valves of the pods hard and leathery.

6b.) var. *quadratum* Asch. & Graebn. *Syn. Mitteleurop. Fl.* 6²:1067. 1910.—*P. sativum* ϵ *quadratum* L., *Sp. Pl.* 727. 1753. *P. quadratum* Reichb. *Fl. Germ. Exc.* 533. 1832. "Pois carre" (French); "Mark; Ecker; Knacker; and Lupinenerbse" (Germ.).

Plants mostly very glaucous, upper calyx lobes often more obtuse; seeds closely set, sides compressed and angular.

6c.) var. *humile* Asch. & Graebn. *Syn. Mitteleurop. Fl.* 6²:1067. 1910.—*P. humile* Mill., *Gard. Dict. ed. 8.* no. 2. 1768. *P. sativum* var. *humile* Poir. *Encyl.* 5:456. 1804. "Pois nains" (French).

Plants small and low, branched. Leaflets roundish.

This comprises the low garden varieties and is not the same as Boissier's plant of this name, which becomes *Pisum sativum syriacum*.

6d.) var. *saccharatum* Asch. & Graebn. *Syn. Mitteleurop. Fl.* 6²:1067. 1910.—*P. sativum* α *saccharatum* Ser. in DC. *Prodr.* 2:368. 1825. *P. sativum* β *macrocarpum* Ser. l.c. *P. gulosum* Risso, fide Alef. *Landw. Fl.* 38. 1866. *P. sativum* γ L. *Sp. Pl.* 727. 1753. "Sugar pea," "pois sucrés, pois mange-tout" (French); "Zuckererbse" (Germ.).

Fruits large with tender, fleshy, edible, and not parchment-like valves; seeds loosely set, globular; peduncles mostly 2-flowered.

6e.) var. *coronatum* Alef. *Landw. Fl.* 52. 1866. *P. sativum* var. *umbellatum* Hort., ex Sutton, *Journ. Linn. Soc.* 42:430, Pl. 15, f. 2, and Pl. 17, f. 10. 1914. Not L. "Crown-flowered" or so-called "Mummy Pea." (A. W. Sutton, l.c.)

Stems tall, about 6 feet, fasciated, with almost umbellate white erect flowers at the top; seeds whitish, globular or slightly wrinkled.

This corresponds to var. *umbellatum* of the field pea, and similar forms are apt to be found among the other species and subspecies.

6f.) var. *ecirrhosum* Berger var. nov.

Plants 20–30 cm high; lower leaves 2-foliate with the usual short rudimentary tendril, all the others without tendril but with a terminal odd leaflet, upper leaves with as many as nine leaflets; leaflets opposite, ovate-obtuse, mucronate, entire or rarely toothed, rather small, decreasing in size, the lower ones about 20 mm, the upper ones about 8 mm long; stipules diverging, somewhat pointed, basal lobes rather short, dentate; lowest flowers from the fourth leaf, peduncles finally about twice as long as the stipules, 1-flowered; flowers white.

This plant is the variety "Acacia;" we do not know its origin. It is a very remarkable pea showing the usual reversion—the rudimentary tendril—on the lower leaves; and entire lack of tendrils on the upper leaves—another reversion to a much older type. The variety merits a botanical name for about the same reason as Duchesne's *Fragaria vesca* var. *monophylla* which also originated in cultivation.



Much whitened, deeply clasping stipules

HARRISON GLORY

(Two-thirds natural size)



CANADA FIELD



SMILEY



BLUE PRUSSIAN



WM HURST



ARISTOCRAT



GOLIATH



MARYLAND PRIDE



SUTTON BEST OF ALL

CHAPTER III

DESCRIPTIONS OF VARIETIES

GENERAL NOTES

In preparation for the descriptions which follow, more than 500 varieties or strains of peas were grown at the Station for two or more seasons between 1922 and 1927. Seeds of these peas were secured from the originators of the varieties wherever possible; otherwise from seedsmen believed to be reliable; but in many cases the choice of source was decidedly limited, the variety being listed in only one or two current catalogs, often not those of the originators. Thus, tho care was taken to secure seed true to name, some errors were revealed and corrected where a known or unknown variety was received for the one desired; and probably other substitutions of this nature have escaped notice. To lessen the danger of such errors, one or more of the authors have visited and studied extensive collections of pea varieties at other places, notably those of the U. S. Department of Agriculture at McMillan, Mich., and Washington, D. C.; and of the J. B. Rice Seed Co., at Cambridge, N. Y., and have exchanged seeds of many varieties with those in charge of these trial grounds, and those of the N. B. Keeney & Son Co., Leroy, N. Y., the D. M. Ferry Co., Detroit, Mich., the J. H. Allan Seed Co., Sheboygan, Mich., the Rogers Bros. Seed Co., Alpena, Mich., the Clark Seed Co., Milford, Conn., the Idaho, Minnesota and Wisconsin Stations, and the University of British Columbia. Many visits with pea experts connected with some of the above institutions and letters from these and other authorities in pea growing have aided very materially in checking up our data and giving most valuable information relative to pea varieties and their history. The sincere thanks of the authors and of the Station are due and are given to these men and firms, and others whose names are so many that our limited space forbids individual mention. In spite of all such precautions, however, undoubtedly critical study of the material here presented will show many errors of which the material here presented will show many errors of which the authors will be most grateful to know.

For information regarding old varieties and others of which seed was not available, and for historical data, books, periodicals and catalogs in great number have been consulted. For errors in compilation of such material the authors are responsible, but for the information itself the works consulted must be given credit.

For recording characteristics of the varieties grown, check sheets were used, made up in advance of the first season's sowing of peas, on which sheets a place was provided for all characteristics of pea plants,—seeds, stems, foliage, flowers, pods, and peas,—that seemed of horticultural, classificatory, or genetical importance, each characteristic being so subdivided that a simple check mark made the record. Different colored pencils were used in different seasons, so that changes in char-

acteristics or their degree during the two or more years of growth of the variety could be shown on one card. In most cases notes were taken on the varieties for three seasons.

In making these sheets, and especially in preparing the data for publication, technical terms were avoided as far as possible, and emphasis placed on those of horticultural importance;—for the practical grower rather than for scientists. It is believed that most of the terms used need no explanation, but it is thought well to define, briefly, a few of them:

Height — Length of main stem extended not quite to breaking point; *not* distance from ground to top of plant grown on vertical support.

Node — Enlargement of stem from which originate stipules and leaf and flower stalks; joint.

Internode — Smooth portion of stem between nodes or joints.

Shape and size — Of stipules and leaflets, average of specimens taken near center of stem; of pods, average of at least twenty specimens collected as representative.

Stipules — Leaflike structures, always paired and larger than leaflets, on nodes at base of leaf-stalks.

Clasping (deeply, lightly) — Degree to which ear-like bases of stipules surround stem.

Glaucous — With bloom, a powdery natural covering of stipules, leaflets, pods or stems, easily removable by rubbing.

Peduncle — Main portion of flower- or pod-stalk.

Pedicel — Short joint of flower- or pod-stalk, connecting peduncle and flower or pod.

Receptacle — Hard enlargement of upper end of pedicel from which neck of pod starts, surrounded by calyx.

Calyx — Collection of five sepals.

Sepals — Small leaf-like persistent floral parts which are attached to receptacle and surround neck of pod.

Dorsum — Back of pod, with dorsal suture on opposite inner sides of which peas are alternately attached.

Ventrum — Front of pod, with ventral suture, which splits to allow peas to escape.

Curved — Pod more or less bowed or arched backward — "hollow-backed" — usually spoken of as recurved; but number of peas with pods curved forward is small, so thought best to use simple term "curved" for varieties generally, with specific mention of exceptions.

End — Of pod, part remote from neck; used with terms pointed, long-rounded, rounded, short-rounded, blunt, square or protuberant to indicate extent of sharpness or bluntness.

Tip — Distinctly marked extended end of dorsum of pod.

Point — Small, threadlike extension of tip found in a few varieties.

Owing to the great number of varieties to be described, it was soon realized that to mention all characteristics for each one, as was done with the major varieties of fruits in the "Fruits of New York," would exceed our allowable limit of space. Accordingly, in discussing the pea varieties, these have been placed in groups in most of which one or more typical varieties are described in detail and the others of the group related to the type by comparison, using resemblances

or differences in characteristics rather than detailed statements of them.

These groups, with some subdivisions, are:

| | |
|------------------------|---------------------------------|
| Extra Early | Large-podded Dwarf |
| Tom Thumb | Pointed-pod |
| Marrowfat | Blunt-pod |
| Seeds White | Daisy type |
| Seeds Black-eyed | Advancer |
| Alaska | Stratagem |
| Scimitar | Champion of England |
| White-seeded | Ne Plus Ultra |
| Green-seeded | Telephone |
| Sabre type | Senator |
| Dimpled-Seeded | Edible-podded |
| White or Cream Seeds | White-seeded |
| Green Seeds | Butter Sugars |
| Wrinkled, Cream-seeded | Dark-seeded |
| Very Dwarf | Field peas |
| Dwarf | Minor varieties in above groups |
| Of Medium Height | from Extra Early to Senator |
| Tall | Undescribed varieties |

In listing pea varieties we have used, as far as possible, the principles applied in "Standardized Plant Names," but since peas were not listed in that work we had no satisfactory guide in many nomenclatural puzzles. In such cases we have usually chosen the simplest, or best known, of the names applied to a variety. In many cases, especially in Edible-podded peas, it was necessary to use complex names, usually combinations of nouns, adjectives and adverbs, since very similar combinations applied to distinct varieties. In case of duplicated names of varieties liable to be confused, we have generally prefixed the introducer's name; as Sutton Hundredfold, Carter Hundredfold. In such cases we have dropped the possessive sign; but have retained this in names like Gardeners' Favorite.

The numbers following the name of each variety refer to similar numbers arranged consecutively, and as far as possible, chronologically, for each variety and for the group, which indicate citations to literature and to catalogs giving historical, genetical and other information relative to the variety, and the synonyms found for it. These group references and synonyms are collected at the end of the descriptive material, rather than separately at the close of each group; which is thought will make easier prompt location of the reference, especially since major and minor varieties of the groups are separated.

Additional references, without numbers, occur very often in connection with the individual varieties. These usually give information relative to the history of the variety in the United States; but occasionally refer to notes coming to the authors' attention after the main lists had been compiled, when interpolation of the reference in its proper place would have involved many changes and would have been very liable to lead to errors.

To economize space, names and synonyms are not repeated, tho used for more than one variety, but the number and place in the first reference to each are given in subsequent citations.

In following these descriptions of varieties the reader must remember that they are based, wherever possible,

on the characteristics and behavior of the plants on our test plats; and that these differ, in many cases quite noticeably, from those of the same varieties grown elsewhere, even in the United States but particularly in England and British Columbia, from which sources seed of many varieties was secured. Tho on fairly good pea soils, giving excellent yields in favorable seasons, our pea-test plats are not high in fertility nor is this quickly available; so that in seasons without abundant spring moisture, particularly if temperatures were high, pea plants were shorter than those grown elsewhere, the pods smaller and less well filled, and the time to edible maturity less. With the taller varieties the height might be two feet, or even more, less than for the same variety grown in England or British Columbia, or one to two feet less than for the same varieties grown in northern Michigan. With varieties of medium and dwarf height the differences were less noticeable, but almost without exception in the same direction.

Differences in pod lengths corresponded in general with lengths of the pods as given in original descriptions, the discrepancy being greatest in those English varieties like Quite Content, V. C., and Giant Stride, which in England showed numerous exhibition pods nine or ten inches in length, but which with us rarely exceeded five inches. Pods of varieties of the Telephone or Ne Plus Ultra groups, reaching five or six inches in England, would average an inch or so shorter with us; while pods of the Large-podded Dwarf, Wrinkled, Cream-seeded and Gem groups compared fairly well in length with those grown elsewhere.

As would be expected, the shortening of the pods on our plats was accompanied by a lessening of the number of peas, usually due to failure of ovules near the end of the pod to develop; and this caused a change in the degree of plumpness of the end of the pod, "long-rounded" or "rounded" pods becoming "pointed;" "blunt ended" pods, "short rounded" or "rounded;" etc., altho these variations were not usually great enough or extending completely enough thru the variety to obscure the classification as "pointed" or "blunt-ended" which was used as a separatory group characteristic.

As these deficiencies of peas on our soils were soon recognized, much care was taken to secure checks on them, by visits to other trial grounds and by correspondence; and attention is called to such differences in the descriptions of many varieties; but the reader must not forget that with many varieties no such checking was possible, and that in such cases the same factors were operative on our plats to lessen the height of plants and to alter the length and appearance of the pods as were noted with the checked varieties. The descriptions of any such varieties, therefore, probably picture the pea as it would grow in normal or slightly sub-normal conditions, rather than as it would be at its best.

One very noticeable effect of our soil upon certain seed characteristics was observed in one season, that of 1922. Before sowing the peas that year, samples of the seed of all varieties were taken and placed in glass vials, closely sealed and held in darkness to retard change in

color. Samples of the crop seeds were also taken late in the season, when practically all varieties were fully ripened, and were similarly preserved for laboratory study and comparison. When these comparisons were made it was found that with practically all varieties except those in the Extra Early, Marrowfat and Alaska groups, a noticeable change had occurred during the season, so that crop seeds were markedly larger than the seeds sown, with much more green pigment in both seed-coat and cotyledons, and with a decided increase in wrinkling of the seed coat. So great were these changes, particularly in many varieties of dimpled peas, that varieties wholly cream-seeded as sown became equally cream-seeded and green-seeded at harvest, while those with part green, part cream seeds at sowing became wholly green-seeded in the crop; and with both color combinations, the seed-coats were practically those of wrinkled peas. Similar, tho less marked, differences were found in the wrinkled peas. We ascribe these differences, either to the soil or to a distinctly moist growing season; but have not been able to decide between these factors. The changes could not have been due to premature harvesting as some have suggested; as all varieties were fully ripe at time of collection of pods, many of them so far along that it was difficult to find pods with unshed peas.

Peas on our plats ripened quite promptly; but we were unable to secure any such precocity as has marked the advertising of many varieties. Marked shortening of the time to edible maturity could be secured by late sowing, throwing the growth period into days and weeks of high heat units, a diminution of a week to ten days or even a fortnight in the length of time to edibility being readily secured by sowing in late May or early June, rather than in mid-April. In an early test to ascertain the influence of date of sowing on time to maturing, short rows of smooth and wrinkled varieties were sown a week apart from early April to early June, a difference of ten weeks in time of sowing; yet pods on the rows last sown were ready for picking less than twenty days after those on the rows first sown. A later, more extensive test¹ in connection with canning crop investigations was made in 1927, to show effect of successive plantings on time of maturity and yield. In this test, Alaska, Surprise, Green Admiral and Horsford Market Garden peas were sown in 200-seed lots at approximately weekly intervals from April 9 to May 28, eight weeks. The time required to canning stage was successively reduced: For Alaska, from 63 days from first sowing to 37 days for those last sown; for Surprise, from 63 days to 38 days; for Green Admiral, from 71 days to 46 days; and for Horsford, from 75 days to 47 days. The yields were also successively decreased with the shortened times to maturity: For Alaska, from 30 ounces of shelled peas from the 200 seeds first sown to 10 ounces from those last sown; for Surprise, from 31 ounces to 11 ounces; for Green Admiral, from 40 ounces to nothing (3 ounces for next to last sowing); for Horsford, from 58 ounces to

4 ounces. In no case was there an exception to the rule, "The later the sowing the shorter is the time to maturity;" and with but one exception, the yields decreased successively with advancing dates of sowing. With Green Admiral those sown April 30 yielded slightly more than those sown April 25.

The shortest time from sowing to edible peas of which we have any record is one from Florida, 30 days; which again connects days of high heat units with quickened growth; and the longest time in America, from northern Michigan, where 112 days was needed from seeding to edibility of an "early" pea. This influence of early and late seeding and similar changes induced by hot, dry seasons probably account for the great discrepancies in recorded accounts of earliness in varieties; such as the *Gardeners Chronicle* statements in succeeding years that "Superior First Early was 10 to 14 days ahead of Early Frame" and "much later than Early Frame."

One fact revealed by our tests of peas, and the same applies to other vegetables subsequently grown, is the surprising uniformity in time of reaching edibility of many varieties of similar type. Catalog notices of the different varieties in the Extra Early Group, for example, in which certain ones are commended as "extremely early," "earliest pea known," or "a full week ahead of any other," with data for different growth periods, led us to expect the time of maturing to be a helpful separatory factor; but, to our surprise, scores of varieties on our soils and under our climatic conditions, sown on the same date, were ready to pick at the same time or were separated by such slight intervals that, as one student of peas of wide experience said, "You need a stop watch to tell which is ready first." It is evident that growers must test unknown varieties with known ones, on their own fields, in the same seasons, to get reliable knowledge of relative earliness.

Our possession of records of early pea tests at this Station, in 1882-1884 and in 1893, enabled us to compare data for many varieties which were also grown, in the same locality, in our recent tests. The later notes showed, almost invariably that pea varieties, unless very carefully watched, rogued, and successively "improved," tend to degenerate with age and produce longer vines, more scanty and narrower-leaved foliage, shorter and more slender pods and smaller peas. For example, Early Kent in 1884 was 2 to 3 feet tall, somewhat branched at base, and with quite large seeds; while recently it was 3½ to 3¾ feet tall, unbranched, and with smaller seeds. It was very evidently returning to the parent type, Early Frame.

Such changes in pea varieties as have been indicated above, with the influence of other factors that is shown more clearly in the discussion of individual varieties, must be given due weight in interpreting descriptions of peas, which are possibly more subject than almost any other vegetable to variations induced by age, soil and season.

¹ N. Y. State Sta. Bul. 553:10. 1928.

EXTRA EARLY GROUP

The name Extra Early must be considered, not as the name of a particular variety, though it has been, and still is, so used; but rather of a group of varieties of similar type. Many of these have the words as part of the name; while others bear more distinctive designations, but are equally "Extra Earlys."

Group characteristics.—In general the Extra Early group is characterized by very early season, slender vines, varying in length from below $1\frac{1}{2}$ feet to above $2\frac{1}{2}$ feet, according to conditions and the rigor of selection for dwarfness, with internodes medium in length or above, unbranched or with a few, small, basal branches; medium to light green, rather scanty to fairly abundant foliage, consisting of four leaflets of medium size and regular shape, and two much larger stipules with rounded tips and teeth usually about one-third of the way from base to tip, of the same basal color as the leaflets but more whitened; with flowers beginning at 8th to 9th node, or 10th to 11th on taller vines, generally single but occasionally paired; with pods from $2\frac{1}{4}$ to $2\frac{1}{2}$ inches or somewhat longer or shorter in a few varieties, plump, straight or slightly curved, having blunt ends and small tips, generally well filled; peas 5 or 6 in number, round, smooth, more or less oval longitudinally, light green or whitish green in color, usually of poor color when cooked unless used early as "petit pois," soon becoming hard, starchy and rather tasteless; seeds round, smooth or very slightly pitted, cream or slightly salmon tinted in color, often almost white especially over certain parts of the pea, or rarely with some seeds light green, with cotyledons yellow or light orange and radicle obscure; weighing from 125 to 150 or more to the ounce.

History.—This group, undoubtedly most complicated of any in names and synonyms, has varied little, except in minor ways; and it is probable that the earliest types showed individual plants hardly distinguishable in some group characteristics, such as habit, precocity, shape and arrangement of pods, number of peas in pod, quality of peas and size and shape of seeds, from plants in varieties or types now grown.

The type unquestionably shows marked improvement; but the advance has consisted in grouping in a new variety or strain more of the desirable characteristics; and, especially, in securing uniformity and permanence of these characters. This has probably been done, in practically all cases, by selection, possibly with some accidental crossing; for no introduction of new blood is definitely recorded. The new varieties, unless conscientiously rogued or selected, rapidly degenerated, returning, in hands of different growers, partially or almost completely to the parent variety. Some one again "improved" the stock and gave it a new name. The introducer, or other growers of the pea, sustained his claims of superiority by comparison, intentional or incidental, with some of the deteriorating strains of the earlier variety; while other growers, who were

fortunate enough to have carefully selected strains of the parent variety to compare with its offspring, pronounced the latter no improvement; and relegated the new name to the list of synonyms. This process, repeated through three centuries in England, France, Germany and Holland, and later very extensively in America, has given us multitudes of synonyms, often repeatedly interlocked, and of present names, for varieties practically identical for all horticultural purposes, but with slight differences which justify at least part of the current names.

Descriptions of early varieties of peas are usually very meagre; but the progenitor of the Extra Early peas was undoubtedly included, in 1629, in Parkinson's (Reference 1) "French pease" at some time brought from France, "or Fulham pease" from the locality near London where they succeeded best. These were very early, hardy, smooth, white peas, with "climbing" vines. Enough of the characters of the Rouncivals, Hastings, Rose, Spotted, Gray, and "Peas without skins" are mentioned by Parkinson, to exclude these as sources from which Extra Early came. The Hotspurs followed the early type, but just when they originated, or what, if any, named varieties preceded them in their development from the "French pease" is unknown. The Messrs. Lawson say that Hotspur dates back to 1670; and the name in some of its modifications continued for at least a century. Some of the Hotspurs or "Hots" headed the list of earliest peas during most of the century, but about 1750 the variety, or the name, "Early Charlton," from "Charlton Hotspur," became common, and remained popular until displaced by Early Frame about 1770. For another hundred years Early Frame held a place in many catalogs, and is even listed by Vilmorin in 1926 under one of its synonyms, *Michaux ordinaire*; but early in the nineteenth century "improved" forms began to displace it, or to be grown simultaneously with it. In England, however, with the advent of Knight's Marrows and other high quality peas, interest in the starchy types diminished, so that no really distinct strains of Extra Early appeared for about 70 years; but American growers, working on stocks which came from England or from France, announced several varieties during the first half of the 19th century. In 1823 Landreth introduced his Extra Early, the first strain to bear the group name, and this is still extensively cataloged, as, when well selected, it holds its own well with the hundred other strains of the group. This was followed about 1827 by Early Washington, Early Dwarf, Early June and others; while in England, and later coming to America, some leading kinds have been Early Warwick or Racehorse, Early Emperor, Prince Albert, and Early Kent.

Practically all of the early names and strains, except Landreth's, have now disappeared, tho some of them still appear in the lists of a few old-time seedsmen.

After 1850 strains, or names, appeared rapidly, one or more every year or two, in this country, in England, or on the Continent, most of the foreign varieties being soon brought to America. Leading varieties in the succession were: Sangster No. 1, Daniel O'Rourke, Dillistone Early, First Crop and Ringleader (identical), Dickson First and Best, Caractus, Philadelphia Extra Early, Hartford (or East Hartford) Extra Early, Dexter (or Early Dexter), Ferry First and Best, Henderson First of All, Rural New Yorker, Breck Excelsior, Maud S, Burpee Extra Early, Lightning, Pedigree Extra Early, First in Market, and Summit. Many of these were found on sale in the United States in 1889, according to Bailey's *Annals of Horticulture* of that year; as were several others, of which it has been impossible to obtain exact dates of origin: Bergen Fleetwing, Premier Extra Early, Eureka Extra Early, Extra Early Challenge, Extra Early Market, Extra Earlys with names of seedsmen prefixed, as well as the name Extra Early alone in many other seedsmen's catalogs, First and Best and Iowa Challenge.

In the next ten or twelve years, preceding the publication of Tracy's list, several more varieties were introduced, the most prominent being Electric (second), John L. Sunol, Extra Early Pioneer, Lightning Express, McLean First and Best, and Rice Extra Early. Bulletin No. 21 of the Division of Plant Industry, U. S. Department of Agriculture, listed the varieties of vegetables offered in all obtainable American seedsmen's catalogs of 1901 or 1902. In this Tracy records Extra Early alone as listed in 68 catalogs; Extra Early with the seedsmen's names prefixed, in 27 cases; and 37 other varieties previously mentioned in the history of the group. Since that time several others have appeared: First Early, Special Extra Early, Keeney Extra Early, Wonderful Extra Early, Giant Lightning, Saxonia or Ohio Chief, Blue Ribbon Chieftain, Record Breaker, and Eversure.

MAJOR VARIETIES IN EXTRA EARLY GROUP

Hotspur.— Refs. 2-8; Booth *Cat.* 1810; Russell *Cat.* 1827; Landreth *Cats.* 1828 and 1832. The history of Hotspur is well indicated in that of the Extra Early group; to which may be added its early appearance in America as recorded by Randolph under its synonym, Ormond [Omerod's?], and by Booth, Russell and Landreth. Descriptions of it are scanty, beginning with that of the Fuller, Stacy, Blackwell catalog, "— the speediest of growth of any, that being sown about the middle of May will in six weeks time return ripe again into your hands." In 1778 it was noted as of moderate growth, 3 or 4 feet with dwarf forms only half as much, and excellent bearing. Landreth, in 1832, says Hotspur closely resembles Charlton; the Messrs. Lawson in 1836 describe the pods as generally in pairs, three inches long and one-half inch broad, nearly straight and well filled with peas similar to but larger than those of Double-blossomed Frame. Name and strain are no longer used.

Charlton. Refs. 7 (in part), 9-11; and Booth *Cat.* 1810; *Gard. Mag.* (Loudon): No. 77. 1836.

(rptd. from *Trans. Hort. Soc.* 2nd ser. 1:396); Sinclair *Cat.* 1839; Burr *Fld. Gard. Veg.* 528. 1863 (citing Lawson, 1836); *Gard. Chron.* 198. 1850 and 292. 1865. Charlton is inextricably mixed with Hotspur in the history of the group. It was listed by American seedsmen in 1810 and in 1839; and Burr described it at some length, his description and another made in England in 1836 being very similar. Burr says:

Plant about 5 feet high, of vigorous growth; leaves large with short petioles; tendrils small; pods broad containing 6 or 7 peas of excellent [?] quality, rather larger than those of Early Frame "with which this is often confounded. It may, however, be distinguished by its stronger habit of growth, flat pods, larger seeds, and by being fit for use about a fortnight later than the Early Frame."

It is elsewhere said to be very prolific, the best pea for standing winter [in England], continues much longer in bearing than Early Frame and varies greatly under different conditions. Burr indicates clearly the connection of Hill's, Hovey's and Landreth's Extra Earlys and Daniel O'Rourke with Charlton, Hotspur and Early Frame. The *Gardener's Chronicle* maintains distinctions between Charlton and Early Frame, giving differences as above; but says, later, practically identical with Prince Albert.

Early Frame. Refs. 12-25; Booth *Cat.* 1810; Landreth *Cat.* 1832; *Gard. Mag.* (Loudon): No. 27. 1836. (rptd. from *Trans. Hort. Soc.* 2nd ser. 1:396); Burr *Fld. Gard. Veg.* 534. 1863; Vilmorin-Andrieux *Les Pl. Pot.* 429. 1883. In England Early Frame supplanted Charlton about 1770; but, as with Hotspur and Charlton, the next references we find to it are in America, where it was listed by Booth, Sinclair and Landreth, before the long list of its synonyms was printed in the *Horticultural Register*. Rogers says this pea was first noticed accidentally by a mechanic, in a field of Early Charlton peas, near Wingham, in Kent. He spoke of the pea to Mr. Russell, proprietor of the Lewisham Nursery, who developed a stock for his customers. The early Double-blossomed Frame was a chance seedling of the single-blossomed form. "With both sorts hundreds of acres have been annually sown in the neighborhood of Dartford, in Kent, for the supply of the London Markets, during the season for which wagon loads in sacks are continually going night and day."

In the *Horticultural Register* reference Early Frame was dismissed very shortly, as "too well known for detailed description;" but it was said to be four or five feet tall, only moderate in yield, and one of the earliest, with white seeds of medium size.

"The great number of synonyms is probably explained by seedsmen giving their own particular title or name to such a good early pea"—a practice not altogether unknown in America! Another fragment of description adds:

Vines slender; pods small, round; peas mostly 4 to 5; very prolific; of excellent quality; and calls it the earliest pea.

Burr's description of the pea in America adds some particulars:

Pods in pairs, slightly bent backward, well filled, rather abrupt at both ends, $2\frac{1}{2}$ inches long by $\frac{3}{8}$ to $\frac{1}{2}$ inch broad; seeds round and plump, cream colored but whitish toward the eye and at the union of the cotyledons. Sown May 1 pods were ready for use in 67 days, which differs but little from the two crops of it grown at the Station, 63 days, making it now, at least, a second early.

Denaiffe described Early Frame (Michaux ordinaire) about 1906:

Second early, $3\frac{1}{2}$ feet tall, pods straight or slightly curved, slender, square at the end, $2\frac{3}{8}$ to $2\frac{3}{4}$ inches long, borne from the 10th node up, well filled, containing 7-8 seeds, yielding finely.

Vilmorin-Andrieux, twenty years earlier, say it might be described as a sub-variety of Early Emperor.

Stems branching just below the flowers, the branches also fruiting; pods always paired, beginning at the 10th node, and forming 12 tiers, or circles, straight, rather narrow and small, very well filled; seeds very round, white shaded salmon, medium in size.

As Early Frame is still cultivated on the Continent, seeds were obtained from France and grown at the Station, for two years, and our detailed description of it differs but little in essential points from much older ones.

Growth, from the same lot of seed, to $4\frac{1}{2}$ or 5 feet in a favorable season or 3 feet in a hotter, drier one, with change of flowering node from 12-13 to 10-11, indicates the variability of characters even in an old, well-fixed variety, and shows the impossibility of speaking in mathematically exact terms of any variety. Similar variations occur in other characters, particularly of pods and peas, which are the principal bases of selection.

Added characters of Early Frame noted by us are: Dark to medium green foliage, as a whole not much whitened,—4 leaflets; stipules somewhat whitened, only slightly larger than the leaflets, lightly clasping, with sharp tips and margins toothed about one-half way from base, moderately prominent tendrils, slender and much curled; flowers white, usually single but often paired, on medium to long, slender peduncles which form medium to short, slender pod stalks ("shanks"); pods almost identical with those described by Denaiffe, lighter in color than the foliage, blunt to square at end with small straight tips; peas of medium size, round, smooth, light green to yellowish green, of fair to good quality for a starchy pea; seeds smooth or sometimes finely pitted, round, very small (165 to an ounce), cream colored or sometimes very light green; radicle very prominent, cotyledons yellow; yield good to very good.

The variety is too late, too tall and has too slender pods to compare favorably with the best current types of Extra Early. It has, however, remained surprisingly good much longer, a century and a half, than do most strains.

Landreth Extra Early. Refs. 26, 27; *Country Gent.* 9:111. 1857; *Burr Fld. Gard. Veg.* 529. 1863; *Rural N. Y.* 41:562. 1882. In a letter to the *Country Gentleman* in 1859 David Landreth says he introduced this variety "thirty-six years ago," thus dating its origin before 1823; and it is listed in his catalog of 1824, selling at double the price of other varieties. Nowhere, so far as we can find, are its parentage and manner of origin stated, but Burr names it, with Hill's and Hovey's Extra Earlies, as an improved American variety of Charlton. All descriptions found are in quite general terms. In 1836, sown June 2, before hot, dry weather, a few pods ready to use were secured in 35 days. Other references emphasize its earliness.

As the first American Extra Early now in cultivation, it seems advisable to give a full description of it as grown here for three years. Sown late in April or on May 1, pods were ready for use in 56 or 57 days, or in 51 days when sown May 22, and pickings continued for almost two weeks, tho shortened when sown late.

Description.—Plants $2\frac{1}{4}$ to $2\frac{1}{2}$ feet high, drooping, so that support is optional, vigorous; stem medium to slender, round, smooth, slightly ridged longitudinally; internodes of medium length and nodes not very prominent; branches usually lacking; foliage abundant to dense, medium green often slightly yellowed, both leaflets and stipules without perceptible bloom; leaflets four, medium in size and shape; stipules considerably larger than leaflets, lightly clasping, of same basal color as leaflets, but considerably whitened, with sharp tip and lower margin cut into a few low teeth; tendrils not striking; flowers begin at 11th node, creamy white, more single than in pairs, on medium to long peduncles, of medium diameter; pods $2\frac{1}{4}$ to $2\frac{1}{2}$, occasionally $2\frac{3}{4}$ inches, medium in breadth, and above medium in plumpness, smooth, round to oval in section, straight, regular, often not perfectly filled to tip, usually filled to edge, with blunt to square ends and medium sized straight tip, lighter in color than the foliage, holding condition rather poorly; peas five to six in a pod, not always uniform in size and shape, of medium size, smooth, round, whitish green in color, of fair quality; seeds smooth, seldom pitted or wrinkled, round, small to medium in size (about 135 to an ounce), cream colored; radicle obscure; cotyledons orange; yield only good, the pods being rather small, and not too well filled.

The variety, considering its age and all conditions, holds a prominent place among the Extra Earlies, and it is undoubtedly the source from which a goodly proportion of our other strains have originated.

Early Washington. Refs. 24, 28, 32, 34; *Mag. Hort.* 7:137. 1841; 10:91, 93. 1844; *Hovey Cat.* 1859; U. S. Pat. Off. *Rpt. (Agr.)*: 18. 1860. From the name, its early listing in America and several notices of it here long before it was tested in England in 1866 or 1867, Early Washington is probably American.

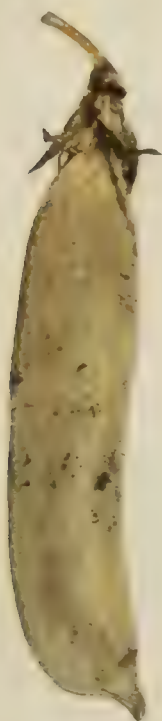
In 1844 it was considered identical with Early Frame; but as it was not compared with it when growing, to establish the synonymy, the name was continued. At Chiswick (Ref. 34) the name was considered a synonym of Early Emperor.

It was for a long time very popular as an extremely early, very prolific, smooth pea; and is still listed in some American catalogs.

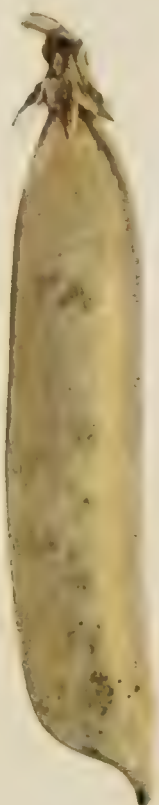
As grown at the Station for three years it was about a half foot taller than Landreth's Extra Early, stouter stems, more angular above; foliage slightly darker in shade, leaflets larger and often more than four, stipules clasping stem more closely, with more bloom, and with rounded rather than sharp tips; flowering two nodes higher up the stem; with pods averaging longer but otherwise similar, not holding freshness quite so well; and with much smaller peas and seeds. It was about as early as Landreth Extra Early but matured over a longer season, nearly three weeks. It gave a good yield, only.

The disadvantages of Early Washington are those of Early Frame, joined with a rather inferior yield due to the small size of the peas.

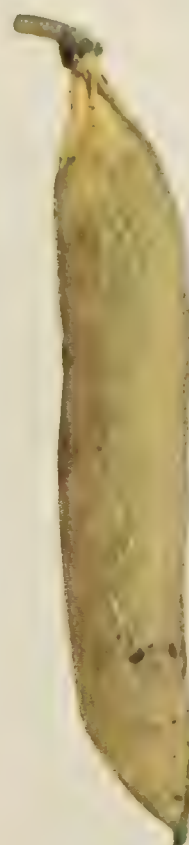
Early Warwick. Refs. 30, 31; *Gard. Chron.* 22 (3rd ser.): 276. 1897; *Mag. Hort.* 3:19. 1837; *Rogers Veg. Cult.* 226. 1839; *Douglas Cat.* 1843; *Mag. Hort.* 10:93. 1844; *Jour. Hort. Soc. London* 4:270. 1849; *Burr Fld. Gard. Veg.* 535. 1863; *Gard. Chron.* 220. 1865. Early Warwick seems to have been developed at



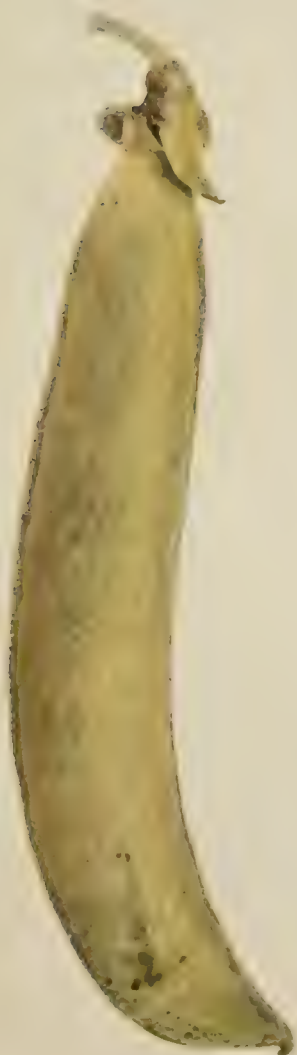
GREEN ADMIRAL



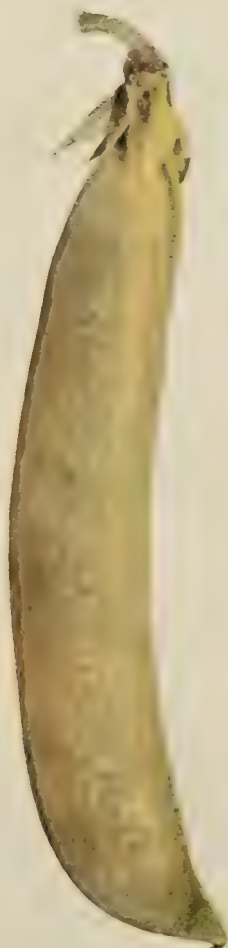
BLUE PETER



AJAX



SENATOR



LINCOLN



MARROWFAT

TYPES OF PEA PODS

(Natural size)



THOMAS LAXTON



ENGLISH WONDER



PERFECTION



MAGNUM BONUM



MELTING SUGAR



BISMARCK

TYPES OF PEA PODS

(Natural size)

Evesham, Warwickshire, previous to 1837, when it was called a great acquisition. It was listed in America in 1843 and again in 1859.

Rogers believed it "an improvement of Double Frame in the pod," a good early pea, prolific, about the height of Early Frame; it was tested in the garden of the Horticultural Society of London in 1849, and considered "in general" Early Frame; but in later tests at Chiswich in 1860 Early Warwick was found "very different from the variety to which it was originally applied," the one raised near Evesham. It was then a "single-blossomed" pea, somewhat earlier than the "double-blossomed"¹ Frames of those days. It gradually lost its single-blossomed character and at time of the test had become identical with the ordinary Early Frames.

Burr says "Now considered identical with Early Frame" but once at the head of early peas.

It is described as 3 feet tall, of strong growth; pods of good size, full, round, long, containing 7-8 peas, of excellent quality; hardy, early, and very prolific. It followed Sangster No. 1 in season.

In 1865 Gardeners' Chronicle says it has superseded Early Waterloo, Charlton, Hotspur, Prince Albert and Early Kent (or May). It is very little, if at all, cultivated anywhere now.

Early Emperor. Refs. 36-41; *Gard. Chron.* 797. 1845; 1. 1846; 382. 1848; 582. 1856; and 487. 1857; Hovey *Cats.* 1854 and 1859; McIntosh *Bk. Gard.* 7:57. 1855; U. S. Pat. Off. *Rpt. (Agr.)*: 314. 1857; *Roy. Hort. Soc. Jour.* 12:5. 1890. Syn. 13, Michaux de Hollande. In a survey of pea varieties in 1892, Early Emperor is reported as grown before 1837, but the earliest record we find is an advertisement for it in 1845, by Warner and Warner, Cornhill, London, undoubtedly the introducers. It was mentioned by Hovey in 1849, probably from English descriptions; was listed by his firm in 1854; was tested in Mississippi in 1856; and reported in 1867 as doing well in Alabama where Eugenia [e], or Alliance, failed. It was evidently a favorite in the South where "pork and bacon peas" were popular.

Earlier English descriptions give height 2 feet, "earliest in cultivation, hardy, good cropper, fine pods of delicious flavor;" later ones, "slender habit of growth *always* with single stem, 2½ to 3 feet high, 8-10 pods, 2½ to 3 inches long, as broad as Sangster No. 1, but appears slender because of length, generally single, perfectly straight as they approach ripeness, almost blunt-ended, with seven peas, white when ripe. Does not compare at all in earliness with Sangster's No. 1, and Dillistone's Early," and "more prolific but poorer flavor than Sangster's No. 1."

In 1890 it was said to be "now dropping out of cultivation;" but in France in 1906, Denaiffe gives a quite full description of it as Michaux de Hollande, distinguishing it from Caractacus and Prince Albert. Denaiffe's description differs but slightly from those of what was probably the same pea grown here in 1884 under the names "Dwarf Michaux de Hollande" and "Michaux ordinaire de Paris" (*N. Y. Sta. Rpt.* 3:251,

253. 1885). Both were shorter-stemmed and plumper-podded than Early Emperor tested here recently from seed produced in France.

Height, 4 feet; stem stout, angular; foliage abundant to dense, dark green, leaflets more often in 3 pairs than in previous varieties, large to medium in size, quite broad, often slightly toothed or notched on margins toward tip; stipules deeply clasping, slightly larger than leaflets, with sharp tips and heavy teeth one-third distance from base to tip, slightly whitened and with slight bloom; flowers at 8th to 10th node, white, single or frequently paired; pods narrower, slightly more curved and more wrinkled than those of Early Frame; peas smaller; seeds smoother, and less often shaded green, but otherwise like those of Early Frame. The greater height than in earlier descriptions, and the slenderness of the pods, probably indicate degeneration in the modern strain, or poor selection.

Early Emperor is still grown in France, as peas of this type are more popular on the Continent than they are in England or the northern sections of the United States.

Prince Albert. Refs. 13, 51-55; *White Cat.* 1846; *Gard. Chron.* 559, 574, 630, 645, 662. 1843; and 373. 1844; *Mag. Hort.* 10:91. 1844; *Gard. Chron.* 52, 67, 199. 1850; *Jour. Hort. Soc. Lond.* 4:270. 1848; *Mag. Hort.* 16:67. 1850; McIntosh *Bk. Gard.* 2:55. 1855; Burr *Fld. Gard. Veg.* 544. 1863. Prince Albert has been a very famous pea. It was grown before 1837, but the first direct reference to it found is an advertisement in 1842 by its introducers, Cormack and Oliver. It came to the United States in 1845, and was listed within a short time by several seedsmen. From tests in the garden of the Horticultural Society of London it was considered a seedling of Early Kent, and pronounced the best early pea, preceding by ten days any other variety sown. Its introducers called it a 42-day pea; but growers and seedsmen disputed for several years over the relative earliness of this strain, Superior First Early, Early Kent, Early Emperor, Double-blossomed Early Frame, Early Warwick, Early Hero, and Early May. Burr gives a rather detailed description of it and Denaiffe draws distinctions between this and other strains.

Height 2 to 3 feet, more dwarf than older varieties of the group but requiring support; stem slender, very seldom branched, internodes long; flowers begin 5th node, white, Burr says paired, Denaiffe usually single in distinction from Caractacus; pods in 6-7 tiers or circles around the stem, 2 to 2½ inches long, straight or very slightly bent backward, round, fairly plump, tapering abruptly at both ends, well filled; peas 6-7, of excellent quality; seeds round, cream colored, nearly white about eye and along median line; very prolific and very early.

Prince Albert was, at one period, the most popular of all the early varieties; and was cultivated in almost every part of the United States. As found in the gardens in 1863 it was not distinguishable from some forms of Early Frame and was being superseded by Daniel O'Rourke, Dillistone Early and other improved strains. Tho still cataloged by a few English and Continental seedsmen and recently grown in United States Department of Agriculture tests, it is probably

¹ "Double-blossomed" means, not that the parts of the flower were doubled, but that the flower stalk was branched, each of the two divisions bearing a flower — the condition we now speak of as flowers or pods in pairs or paired.

no longer found in American gardens; and was not grown at the Station.

Early Kent. Refs. 56, 57; *Jour. Hort.* 48:378. 1872; *Mag. Hort.* 16:67. 1850; *Hovey Cat.* 1859; *Rural N. Y.* 12:271. 1861; *New York Sta. Rpt.* 1:86. 1883. Syns. 7 (Charlton and Hotspur), 20 (first), 35, 51, 55 (second and third). Tho available records do not show Early Kent until a year or two after Prince Albert was offered for sale, the latter was called the seedling of Early Kent when tested in the gardens of the Horticultural Society of London, so Early Kent must have been the older. It was grown very extensively at Higham, Kent, a very early locality, the combination of place and earliness giving the pea its name in London markets. It was in America before 1850, but probably never as extensively grown, at least under its own name, as Prince Albert. It was grown and quite fully described by Prof. Goff, Horticulturist of this Station, in 1884; and was again tested here for three seasons beginning in 1922.

Goff's description differs very slightly, in points covered, from the one made later.

The plants were distinctly dwarfer, with some tendency to branching from the base, and seeds decidedly larger. The change to taller, unbranched vines and smaller seeds is quite plain evidence that the variety is returning with age to the original type, Early Frame or its predecessors. As grown at the Station in 1893 (Bul. 69) it was one of the most productive first earlies.

In the recent Station tests the plants were $3\frac{1}{2}$ to $3\frac{3}{4}$ feet tall; stems slender, but becoming coarse, hollow and square towards tips, unbranched; foliage dense, dark to medium green, without bloom even on stipules and not whitened; leaflets and stipules like those of Early Frame; flowers and pods like those of Landreth Extra Early but latter more uniform in size averaging slightly longer and frequently containing one pea more; seeds smaller and more likely to show some green shading. Not as early by two or three days as Landreth and had a longer season. The yield was very poor.

Now a wholly undesirable variety.

Early May. Refs. 35, 62-64; *Hogg Gard. Yr. Bk.* 14:72. 1873. Early May was grown in England previous to 1837; was listed in America 10 years later. Hogg calls it a synonym of Early Kent. No satisfactory description was found except in late French sources.

In the earliest of these the height was given as $3\frac{1}{3}$ to $3\frac{1}{2}$ feet; flowers from 8th or 9th node; pods in 7 or 8 tiers, or circles, paired, straight, square-ended; peas 6-8, small; seeds round, white or salmon tinted, 130 or more to the ounce. It was a second early, a free and long bearer, and useful market gardener's pea. A quite recent description makes the plants decidedly shorter-stemmed, with pods borne very low and often in nine tiers. It resembles Caractacus, flowering at the same time but maturing more slowly, and more productive.

Probably not now grown in America.

Sutton Early Champion. Refs. 68-70; McIntosh *Bk. Gard.* 2:51, 56. 1855. Syns. 36, 40, 68-70. This Early Champion was advertised by Sutton in 1849, which is probably about the date of origin; and its similarity to other existing varieties was soon noticed. No American references to it under its own name have been found; but it may have been grown under one of its synonyms. The original type was said, a few years after its introduction, to be a variety of Early Frame and to have no merit over the original; and the improved

type, introduced nearly twenty years later, was considered identical with Daniel O'Rourke.

As grown at the Station, from University of British Columbia seed, it was decidedly early, rather more dwarf but similar in most respects to the typical Frames; flowering low; with shorter pods, somewhat wrinkled when at best stage for picking, containing only 3-5 peas, considerably larger than those of many other extra earlies. The seeds were also rather large, often slightly pitted, and many were distinctly shaded grayish green over the orange colored cotyledons.

Sangster No. 1. Refs. 77-85; U. S. Dept. Agr. Rpt. 1856; *Burr Fld. Gard. Veg.* 533. 1836; *Hogg Gard. Yr. Bk.* 14:72. 1873. Syns. 34, 70 (Daniel O'Rourke, Sutton Improved Early Champion), 73, 77-85. Sangster No. 1 has been one of the most famous peas, both in England and America. It was first announced in 1851 by Hay, Sangster & Co., and was, within a few years, probably the source of more comments, reports of trials, lists of synonyms, etc., than any other pea. It, with Dickson First and Best, was said to show no frost injury in a trial where several other strains were severely hurt.

It came to America very promptly, being tested in Mississippi in 1856 and there found the best of nine varieties. Burr gives the name only as a synonym of Daniel O'Rourke; which Hogg reverses; but both strains have been repeatedly cataloged since then by many American seedsmen.

Fragmentary descriptions of the Sangster differ slightly among themselves but not more so than do plants of it grown at the Station from seed obtained in British Columbia and in England. From the first, seeds sown May 22, pods were ready in 42 days, and from the second lot, sown on the same date in another season, in 49 days. When both were sown on May 1, in the same year, the British Columbia strain was three days earlier than the other, — 54 and 57 days.

The British Columbia strain was slightly taller, flowered two nodes higher, and was rather smaller in pod, with somewhat fewer seeds to the pod, slightly larger peas and seeds, and the latter are all bright cream in color, while the English seeds were duller cream with a decided admixture of light green. Early descriptions emphasize the whiteness of the flowers of Sangster No. 1, as separating it from a few other strains; but this does not apply generally; and no marked differences separate the plants grown at the Station from those of varieties previously described. It has the same approximate season, plants 2 to $2\frac{1}{4}$ feet high, medium to slender, usually unbranched stems; abundant dark green almost bloomless foliage, with regular leaflets; single or occasionally paired, medium sized, plump, blunt-ended pods, slightly lighter in color than the foliage; and the same light green, almost round peas, which change to cream colored, occasionally light green seeds, all with orange-colored cotyledons, and averaging about 125 to the ounce.

The rather small pods and comparatively poor yields of Sangster No. 1, and other varieties directly grouped with it, make them now unworthy of consideration.

Daniel O'Rourke. Refs. 90-98; *Mag. Hort.* 21:397. 1855; *Rural N. Y.* 12:271, 1861; *Hawley Cat.* 1868; *Gard. Mo.* 22:113. 1880; *Vilmorin-Robinson Veg. Gard.* 495. 1920; Cent. Exptl. Farm. (Can.) *Bul.* 34:20. 1902. Daniel O'Rourke ranks with Sangster No. 1 as a much discussed pea; and the two in recent years, at least, have been considered synonymous, choice of name depending on preference or prejudice of the user. According to David Landreth, Geo. Charlwood, an Eng-

lish seedsman, said seed of Daniel O'Rourke came from America; and Landreth maintains that the seed was derived, through Early Burlington, from his own Extra Early. Except for this Landreth letter, which is very straightforward and positive, credit for Daniel O'Rourke is given to Waite, who offered it in England in 1853, as being a week earlier than Early Emperor, with large pods and a better yielder. It was named from the Derby winner of the previous year, but neither origin nor history are given. It was listed in America within a year of the English advertisement and was shown before the Massachusetts Horticultural Society the following season. It soon became widely known, perhaps to a considerable extent through the name, and in 1880 was regarded as "still the most popular among myriads of varieties of peas, new and old." Many of the partial descriptions attempt to separate Daniel O'Rourke from Sangster No. 1, Early Princess, Prince Albert and other varieties; but it is very doubtful that any of these distinctions would hold under changed conditions for the varieties compared. As early as 1868 both English and American strains of O'Rourke were recognized. It was carefully described in 1884 by Prof. Goff, whose characters, where comparable, differ but slightly from those of plants recently grown at the Station for four seasons. Improved Daniel O'Rourke was also grown at the Station in 1893 (Bul. 69), for the World's Fair display, and called "one of the best of the old varieties." In the later comparisons, seed from the Idaho Station proved to be untrue, or a degenerating strain, but that of Improved Daniel O'Rourke gave plants typical of the original variety as commonly described. Plants from the Idaho seeds were tall, with long, sharp-pointed leaflets and "rabbit-eared" stipules, unbranched, flowering very high on stem, and producing long, many-seeded pods, with very small seeds,—all signs of inferiority. As is true of most "Improved" strains, that of Daniel O'Rourke was soon pronounced identical with the original. As Landreth claims identity, at origin, of Daniel O'Rourke with Landreth's Extra Early, it is of interest to note how very few are the points of difference between the two as grown at the Station in the same season and in adjoining rows tho not exactly side by side.

The Landreth variety is given first in each comparison: Height $2\frac{1}{4}$ '– $2\frac{1}{2}$ ', $2'$ – $2\frac{1}{4}$ '; stem round, angular; branches lacking, few; flowers 8th node, 8th–11th; pods single or few pairs, single; pods $2\frac{1}{4}$ '– $2\frac{3}{8}$ ' inches, $2\frac{1}{4}$ '–3 inches; not always filled to tip, filled; peas medium size, large; sown April 27, ready 57 days, 59, and in another season, sown May 1, 56 days, 56; crop good, good to very good. In practically every case, differences can be accounted for by slight variations in vigor of seeds from different sources; and in the remainder of almost 100 points of possible difference the check marks were the same.

First Crop. Refs. 120; U. S. Comr. Agr. Rpt. 1865:29. 1866; Hogg Gard. Yr. Bk. 14:76. 1873. First Crop was distributed by Carter in 1864, but in 1865 was acknowledged by both Carter and Sutton to be identical with Sutton's Ringleader. Separately, each seedsman obtained from the same grower (now unknown) stock of a very carefully selected strain of peas, which each distributed under a new name. Both

for some time maintained that the strain was distinct from others, like Sherwood's Railway and Dillistone Early, with which most authorities considered it identical. Ringleader was perhaps most widely distributed in England and general references will be found under that name. The name First Crop came to America first; and the strain under that name was carefully described by Prof. Goff in 1884; none of the characters he gives, however, would separate the strain from many others of the Extra Early group. His synonyms are those commonly associated with the two names, and he says the strain was a selection from Early Kent. It was also grown here in 1893.

Ringleader. Refs. 119–121; Gard. Chron. 233. 1866; Denaiffe L. P. P. 107. 1906; Jour. Roy. Hort. Soc. 32:336. 1907. As stated under First Crop, Sutton's Ringleader was distributed by Sutton in 1864, and the two varieties were declared identical in 1865; but the strain was claimed in 1866 not to be the same as other varieties of the group and period. The descriptions given do not suffice to show distinctions that would not disappear under other conditions or within a few years. Denaiffe makes comparisons of First Crop with Caractacus, which was advertised in 1865; but admits that the latter variety varies greatly and that some strains of it cannot be distinguished from First Crop (Ringleader).

An improved strain of Ringleader was distributed some time before 1907, which was pronounced in the Royal Horticultural Society gardens only a "fine stock" of the old variety.

No records of Ringleader were found in American literature, but Improved Ringleader was grown at the Station for two seasons.

Seeds larger and more pitted than seeds of similar varieties grown in the United States; foliage decidedly lighter green than that of Landreth Extra Early, leaflets broader and stipules larger, pods the same in size, slightly broader, not so well filled to the edges, and with fewer peas, so that these were larger than those of Extra Earlys commonly run; 48 days from late sowing to picking, 56 from early; crop was good.

Dickson First and Best. Refs. 122, 123; Gard. Chron. 1185. 1864; Ibid. 172. 1866; Ibid. 701, 1172. 1867; Ibid. 660. 1868. Dickson (1) announced this pea in 1864, contemporaneously with the preceding two strains. It was soon declared identical with them; and pronounced by the Royal Horticultural Society, in 1866, "a very pure strain of Dillistone Early;" in 1867, "a first class selection from Sangster No. 1," two days later than Dillistone, a stronger grower and free bearer; and in 1868, "a good selected stock, same as Daniel O'Rourke." The petals of most of these strains were evidently creamy in color, as special attention was called to the whiteness of flowers of Carpenter Express and Sangster No. 1. The latter variety and this First and Best were said to show no frost injury where other varieties were severely affected. It was first grown in the United States, as First and Best Early, in 1865.

Dickson First and Best was grown here for two seasons, from seed received from the Idaho Station.

Rather late, quite large-podded (2½ to 3 inches), productive Extra Early, with very well colored, medium sized to large peas. In United States Department Agriculture tests the pods were more curved at the end than in most varieties of the group.

Caractacus. Refs. 124-128; Bliss *Cat.* 1870; *Country Gent.* 36:124. 1871; *Gard. Mo.* 16:40. 1874; Gregory *Cat.* 1885; Benary *Cat.* 1905-6. Caractacus was advertised in 1865, by Waite, with note, "stock exhausted this year;" so it undoubtedly originated earlier. One commentator says it was carefully selected by Waite from Daniel O'Rourke, another that it is Dillstone Prolific type, but Denaffe says it has always yielded better than Daniel O'Rourke or Prince Albert, its only fault being irregularity in appearance and earliness, with marked tendency to deteriorate. The list of synonyms shows its similarity to several other varieties, if not identity with them. It does not seem to have attracted as much attention in England as several others of its type and time; but came to America soon, was listed by many seedsmen, mentioned several times by agricultural periodicals, and tested by Prof. Goff for two or three years. It went also to both France and Germany.

Plants grown at the Station in 1923 and 1924, from foreign seed, were considerably shorter than those described by Goff in 1884, raised from American-grown seed, but notes by him on the crop of 1885 show plants only a few inches taller than those grown here later, 2 to 2¼ feet. His description agrees with our own in indicating somewhat more glaucous foliage than that of Landreth Extra Early or Early Frame, larger stipules, and pods decidedly lighter in color; but his pods were larger than ours, 2 to 2½ inches, against slightly over or slightly under 2 inches; he found 5-7 peas to a pod, we found 3-6; his seeds were larger and smoother than ours, but agree in being sometimes shaded green. His crop matured "rather early," ours in 49 to 54 days. In spite of small pods Caractacus gave good or very good yields.

Philadelphia Extra Early. Refs. 131-135; Evans *Cat.* 1868; *Country Gent.* 36:134. 1871; Buckbee *Cat.* 1894; Buist *Cat.* 1913; Condon *Cat.* 1918. The history of Philadelphia Extra Early is obscure. It was listed by the Department of Agriculture in 1865 and cataloged commercially in 1868, but without added information. In 1885 it was said to be a standard early variety in Philadelphia markets, and in 1918 was called an improved strain of Landreth Extra Early, which, from date of first mention and place, seems quite likely, but Prof. Goff, in describing the pea in 1884, says it is probably from Daniel O'Rourke,¹ and thru the latter from Early Kent and Early Frame. In Buist's catalogs, Philadelphia Extra Early is said originally to have been called Hancock's. If a conjectured origin for Hancock (p. 84) is true, Philadelphia can be traced directly to Landreth Extra Early. Ferry makes Philadelphia Early a synonym of Burlington, and the latter came from Landreth Extra Early.

In 1884, at the Station, height 1½ to 3 feet as compared with two strains of it recently tried here, both from American-grown seed, in which the heights were 1½ to 2 feet, and 2 to 2½ feet respectively. The descriptions, separated by 40 years, agree in certain characteristics in which the pea differed a little from others of the group. Branches few, basal foliage similar in color to Land-

reth Extra Early, a little lighter in shade than several others of the group; pods nearly 3 inches long, end very blunt (Goff); "square" recent, color light, peas fewer. The seeds of the old strain same in color as those of today, but showed a slight shade of green in some cases, which was lacking in both the parent and crop seeds in the recent tests. This factor has no separatory value between closely allied varieties. Goff called the strain "very early," but figures he gives for it in 1883 show it required 64 days from April 21 to edible condition; while the strains grown in 1922, '23 and '25 required 54 to 56 days from sowings a week or ten days later than the 1883 test, and only 49 days when sown May 22. Goff said, "not prolific," and our crops were checked "fair," only. Philadelphia Extra Early, around Geneva, at least, does not compare favorably with several other Extra Early strains.

East Hartford. Refs. 10, 143-146. This strain was listed in 1868 by Hawley, but may be older. It was found in 1889 to be one of the better peas among 80 varieties tested in Vermont,—a reputation it still deserves in this group, according to our tests. In 1914 it was said to be popular among Hartford market gardeners as an extra early, smooth pea,—a prolific bearer of rather small pods containing peas of good quality.

Our three years' test of it does not emphasize the earliness, but it gave a "very good" yield; the pods were borne singly, were small, 1⅞ to 2¼ inches long, rather broader, less plump, and with rounder ends than those of some other strains, containing 4 to 7 peas, rather better in color than the average, and of good size. The seeds first sown were small (178 to the ounce), but those of the resultant crops were much larger, cream colored, with some shaded green. In other characters it is indistinguishable from Landreth Extra Early.

The strain is evidently well fixed, without the tendency to deterioration which is a fault of so many varieties.

Emerald Gem. Refs. 147, 148; Thorburn *Cat.* 1873; *Rural N. Y.* 43:554. 1883; Vilmorin-Robinson *Veg. Gard.* 496. 1920. Emerald Gem was introduced by Sutton in 1871, after several years' trial and some temporary naming. It was similar in color of foliage and pods to Girling's Danecroft Rival, and was held to be a revival of that old variety; but Sutton apparently sustains his contention that Emerald Gem had no connection with Danecroft. In all respects but color of foliage it is an Extra Early; but total lack of bloom on stems, foliage and pods gave them a peculiar, semitranslucent, glazed, green color. It was very early.

It was introduced into America in 1873, and cultivated to some extent as a curiosity because of its peculiar coloration.

According to Denaffe (*L. P. P.* 28, 1906) a dwarf form of Emerald Gem (Nain Emeraude très hâtif) only 10 to 12 inches high, is known in France.

Dexter. Refs. 151-154. Dexter was said by Gregory to be "an American pea sent out by a gentleman who is probably the largest grower of seed peas in America," John H. Allan; and a letter from the seed company bearing Allan's name, of Nov. 22, 1926, says the pea was introduced in 1870. According to Allan's later catalogs, the original name was Allan's Early Dexter, though this appears last in the list of synonyms. Like Racehorse, Eclipse, Daniel O'Rourke, Maud S and Sunol, this pea honors famous horses. Only general

¹See ascribed connection of Daniel O'Rourke and Landreth Extra Early, pp. 26, 27.

characteristics of the strain have been found in print, and it is now seldom, if ever, listed.

Ferry First and Best. Refs. 157, 158; *Rural N. Y.* 42:553. 1883; *N. Y. Sta. Rpt.* 2:87. 1884; *S. Dak. Sta. Buls.* 85:4. 1904; and 91:5. 1905. First and Best was announced in 1882, and grown the next year at this Station and other testing grounds. It was compared with other varieties and found similar in some respects; but since it was not pronounced identical with any, it was undoubtedly a rather distinct strain. The descriptions do not enable us to distinguish it from other varieties of the time, and sometimes disagree, showing that all characters, at least, were not constant.

Its pods were said to be somewhat smaller and lighter in color than those of Henderson First of All, but leaves of same size, and larger than those of Carter New. Some of the seeds were considerably wrinkled. It was not specially early but ripened most of the pods promptly. Cooking tests in South Dakota for two years agree in assigning poor quality to the peas. Not tender, sweet, nor juicy, very hard, very starchy and tasteless or "rank" in flavor.

It is still cataloged and appears to be a superior strain of Ferry Extra Early. Selection has undoubtedly been maintained, and the stock probably improved to keep pace with more modern types of the group. It was not grown in recent Station tests.

Iowa Challenge. Refs. 159; *Iowa S. Co. Cat.* 1899; also letter from this firm, Nov. 30, 1926; *Mich. Sta. Spl. Bul.* 31:24. 1905. Iowa Challenge was introduced, as Challenge, previous to 1883 by the Iowa Seed Co., the name being changed in 1889 to Iowa's Challenge and later to Iowa Challenge. The firm says later that the variety is dwarf and a favorite with the Des Moines market gardeners. As grown in Michigan it was found tall, with 10 to 12 pods per vine and 4 to 7 peas per pod.

Grown here for three seasons, it was only 1½ to 2 feet high, with long-stalked, large pods (2½ to 3 inches), borne singly; peas 5 to 7, medium sized to large, light green, becoming cream colored when dry, with some shaded green. It varied considerably in season in the three years, but, on the whole, would generally follow some of the other strains, and crops were only fair.

Henderson First of All. Refs. 162; *N. Y. Sta. Rpt.* 2:86. 1884; *Mich. Sta. Bul.* 57:41. 1890; *S. Dak. Sta. Buls.* 85:4. 1904; and 91:5. 1905. This First of All was introduced in 1883 by Henderson and tested the same year at this Station and other trial grounds. Sown at different dates at three places it was ready in the following times:

From April 6, 67 days; from April 21, 61 days; and from May 1, 52 days; exactly the same in season as Ferry First and Best in each locality. What is probably the same First of All was recently grown at the Station for three seasons, and pods were ready: When sown April 27, in 55 days; May 1, 54 days, and May 22, 50 days.

Quite dwarf, 1½-2½ feet, occasionally 3, in early tests, and 1¾ feet in later tests; stem very slender, rarely branched; foliage medium green, not glaucous, stipules sometimes whitened, much larger than leaflets; pods single, at 9th node (recent), 2 to 2½ inches long, paler than foliage, appearing slender but well filled, with blunt ends and distinct straight tip; peas 5 to 6, medium in size, light green, slightly oval, or oblong when compressed in pod; seeds cream colored over orange colored cotyledons, with obscure radicle.

Some of the comparisons given make the plants taller by an inch than First and Best, with rather more peas by weight. The cooking tests in South Dakota show no material improvement in quality of the peas over First and Best.

The strain is still listed and grown.

Rural New Yorker. Refs. 165, 166; *Gard. Chron.* 22 (new ser.): 57, 1884. Rural New Yorker was developed in 1883, or shortly previous, by Cleveland, and in 1885 was distributed as a premium to its subscribers by the periodical for which the pea is named. It was tested in the Rural Experiment Garden for two years before introduction and reported very early, with heavier pods and peas than those of First and Best or First of All. Seed of it was advertised in England in 1884 and it later reached France. In all three countries it was soon pronounced the same in all essential respects as some of the existing strains, such as First and Best, Philadelphia Extra Early, First Crop or Prince Albert.

As grown at the Station for three years of the last four, it showed no distinctive characteristics.

The peas were perhaps a little larger than those of the average Extra Early, slightly indented by compression in the pods, oblong rather than round, producing seeds more pitted than most others of the type. The vines were not specially vigorous and sometimes showed considerable yellowing. The pods were ready in about 56 days from late April or early May sowing, and pickings could be made for more than two weeks, the long season being useful in private gardens but a detriment in growing for market.

Breck Excelsior. Refs. 168; *Rural N. Y.* 43:414. 1884; and 45:218. 1886; *S. Dak. Sta. Buls.* 85:4. 1904; and 91:5. 1905. The first mention of Breck Excelsior was in 1882 at a meeting of the Massachusetts Horticultural Society, where it was pronounced a splendid variety, as early as Daniel O'Rourke. Other references of the time confirm its earliness, and say it is not as tall by 6 inches as other Extra Earlies. Later references indicate partial degeneracy of the type in increasing height of vine; and note the poor quality of the peas.

It is not the same as Early Excelsior of the same seedsman, a wrinkled variety.

Maud S. Refs. 173-177. Allan claims to have obtained Maud S from Early Dexter "by hybridization" and careful selection, in 1885. No information is given as to the other parent of the hybrid, if the pea is one; Gregory calls it a "sport" from Early Dexter; while others make it synonymous with First and Best, Earliest of All, and Morning Star. The denting of the seeds spoken of by Allan, and found in recent tests at the Station, with the grayish green shade of the peas, indicate the possibility of influence from some pea outside the Extra Early group; but in every respect but these, including season and length of picking, it is true to the type. It is said to be very resistant to cold. The crop has been reported all the way from very good to "one of the poorest in yield." The Station tests found it only "good." Possibly from the name, Maud S has been quite popular and is still frequently listed.

Burpee Extra Early. Refs. 180; and letter from Burpee Co. This pea was first tested at this Station in 1886, but was introduced in 1881 by Burpee, being

specially selected from Philadelphia Extra Early. Later this variety, with many others tested here, was found to resemble Philadelphia Extra Early so closely that there seemed no reason for calling them distinct. From the production data given it seemed about intermediate in the group of very similar peas, with more pods to the vine but less peas to the pod than Philadelphia, but much less of both than Eureka Extra Early.

Lightning and Giant Lightning. Refs. 181-185; *Rural N. Y.* 46:468. 1887; U. S. Dept. Agr. *B. P. I. Bul.* 21:288. 1903; *Barr Cat.* 1912; *Price & Reed Cat.* 1913; *Farmer Cat.* 1914. Lightning was distributed by Carter about 1886; and came almost immediately to the United States, as seeds from two sources, both American, but stock probably imported, were sown at this Station in 1887. The two lots varied in productivity, one bearing one-fifth more pods to the vine, and averaging more peas to the pod; but they were otherwise alike. They were compared with three varieties of the Alaska type from which they were said to differ only in seed color. Other references remark the similarity of Lightning to First Crop, First and Best, Prince Albert and other Extra Earlys, but usually credit it with marked earliness which was also shown in the 1887 Station tests. The pods were decidedly small, a defect which was remedied about 1908 by Carter's introduction of Giant Lightning. This has pods nearly twice as large and more numerous than those of its predecessor, and larger peas, but is otherwise the same. This was grown here in 1926, was early, and gave a fair crop of large, light colored pods of typical, but slightly broad, extra early type, containing 4 to 7 very large, whitish green peas. In this variety, when well grown, the rather too prominent tip of the pod of Lightning is reduced in proportion, if not in size. It has been grown in America since 1913, at least.

Lightning Extra Early, of the Moore & Simon Co., is probably the same as Carter's Lightning, tho the catalog emphasizes the green color of the pods.

Seeds of a Price & Reed Lightning pea were secured from a New York State seedsman, and the strain was grown here for two seasons.

It proved from six to eight days late for a typical extra early; was very dwarf ($1\frac{1}{2}$ to $1\frac{3}{4}$ feet), unbranched; foliage medium to light green, decidedly whitened and rather scanty, often with only two or three leaflets; first flowers at 7th or 8th node, which were cream colored, single, or rarely paired; pods were short ($1\frac{5}{8}$ to 2 $\frac{1}{2}$ inches, very plump, straight, with blunt to square ends, light green; peas 3 to 5, large, rather oblong, indented, light green to medium green; crop seeds were, as was very often the case on Station soil, very decidedly larger than the seeds sown, and often deeply pitted.

The lateness of this pea, dwarfness of the plants, and sparseness of the foliage would seem to separate it from Carter's Lightning.

Pedigree Extra Early. Refs. 186, 213; *Bolgiano, J. Cat.* 1911; *Allan Cats.* 1913-15; *Berry Cat.* 1920; and letters from Field, Nov. 24, 1926; Livingston, Nov. 20, 1926; and Keeney, Nov. 24, 1926. Pedigree, from a current strain of Extra Early, was developed by Keeney, from that firm's first single-plant selection, starting about 1893, carried for further selection until

about 1900, and distributed by several seedsmen. When announced it was considered "the best strain of Extra Early ever offered to the trade," very uniform, about $2\frac{1}{2}$ feet high, pods $2\frac{1}{2}$ to 3 inches long, well filled, with 6 to 7 peas; not as early as Sunol or Maud S.

Pedigree Extra Early was grown at the Station for two or more seasons from seed from different sources, including the originator. In each case it was a rather dwarf strain, $1\frac{1}{2}$ to $1\frac{3}{4}$ feet; with a few basal branches, producing flowers and pods singly, rarely in pairs, at the 6th or 7th node; pods of typical shape in all strains, but in one strain averaging nearly half an inch longer and with one more pea per pod, the peas and the seeds, also, being distinctly larger in this strain, and larger than in most Extra Earlys, the other strains being typical in these respects. The originator's strain was about a day earlier, also, both being somewhat earlier than Landreth Extra Early; but crop yields, because of a larger number of pods, favored the other strain.

The Livingston letter referred to above gives First in Market as a synonym of Pedigree Extra Early, which is probably incorrect. (See First in Market, beyond.)

The Henry Field Seed Co. says its Improved Extra Early is Pedigree Extra Early.

First in Market. Refs. 187, 188; and letters from Livingston, Nov. 20, 1926, and Keeney, Nov. 24, 1926. Livingston introduced First in Market about 1886, when a sample was sent to this Station for testing. This company says in a letter, "The N. B. Keeney & Son Co., Leroy, N. Y., were the originators of First in Market and the name that they used for the variety is the Pedigree Extra Early." This is probably a slight error, as according to the Keeney letter work on Pedigree Extra Early did not start until 1893, and First in Market was known in 1886. Previous to 1893, however, the Keeney Co. had developed another improved strain of Extra Early, which was named Extra Early K. B. [Keeney's Best], and this was probably the strain Livingston secured and named First in Market.

It was found not distinct from Philadelphia Extra Early; but it is still retained in Livingston's and a few other catalogs; and seed of it was secured recently and sown for three seasons. This strain and Philadelphia were practically identical, with date of maturing the same and both crops checked "fair to good."

Best Extra Early. Refs. 190-192. In the spring of 1888 this pea was distributed by Burpee to about 3,000 growers for testing; but was not regularly placed in commerce until the next year. Only numerical data for it are given in the Michigan bulletin. When sown March 9, it required 119 days to picking, yet was called "very early;" and it produced only a medium crop. In France it was found very like Prince Albert, with pods same form and size, lighter-colored foliage, larger peas but poorer yield, and much earlier. It was grown at the Station from 1922-'25, part of the seeds for the first test coming from British Columbia and part from Burpee.

Seeds of both lots were more or less pitted, even slightly wrinkled. The foreign ones were much larger and all beautiful cream in color, while those grown in the United States were considerably mixed with green-shaded peas, and very much smaller. These differences disappeared almost entirely in seeds from the two crops, the British Columbia stock becoming more green and the domestic

stock decidedly larger, on Station soil. The pods were of very good size, frequently reaching 3 inches, and the crops were "very good," decidedly above the average, but in other respects, both strains were typical Extra Earlys, possibly a day earlier than most others.

Summit. Refs. 195-197. Summit was introduced, probably prior to 1889, by Northrup. It was tested in that year at this Station and has been grown here again for three seasons. The successors of the firm introducing the pea say in catalogs that it was 2½ feet high, earliest, most even in maturity, and with the largest pods of any extra early variety; but according to a recent letter, they discarded the variety "many years ago." Its curved pods might place it in the Scimitar group.

The early catalog statements are, in general, confirmed by the first Station tests which adds that the foliage was light green, pods usually single, considerably curved, 2-2½ inches long, slightly wrinkled; peas small, smooth; ready in 51 days, even when sown April 18, picking for more than a month, and "enormously productive."

The strain must have deteriorated in 30 years; for as grown here recently, from seed from the same firm, it is merely a typical Extra Early, slightly taller, 3 feet, a very poor producer, with slightly larger than average pods, not specially early and with much shorter season than in 1889.

Bergen Fleetwing. Refs. 198, 199; *Kans. Sta. Rpt.* 1889:152. 1889; *Gregory Cat.* 1890; *N. J. Sta. Rpt.* 1898:147. 1898. The synonym given by Tracy, Grenell's Extra Early Bergen Fleetwing, connects the pea with Grenell, but credit for it is usually given to Gregory; since he speaks of having "raised" this pea, and in English pea literature "raised" usually means originated. In the same reference Gregory calls Bergen Fleetwing a "new" pea; but says "a great favorite with market gardeners on Long Island," which could hardly be true of a really "new" variety.

A description of the pea, collected from several sources which agree in the main, makes it vary from 1½ to 3 feet in height; with slender, unbranched vines; foliage light green, or slightly bluish green; leaflets 2-4, smooth, entire, rather obtuse; pods usually single 1½ to 2½ inches long, rather broad, plump, straight or slightly curved, lighter in color than the foliage; with 3-7 peas (averaging 5.22 from 100 pods in Kansas), seeds yellow, smooth. Season almost if not quite as early as that of Alaska, and picks for over a month; very productive.

Evidently a typical Extra Early of very good type, but now superseded.

Eureka Extra Early. Refs. 206, 207; *Dreer Cat.* 1894; *Rural N. Y.* 54:314. 1895; and letter from Dreer, Dec. 8, 1926. Eureka Extra Early, very distinct from Eureka, was introduced in 1879 or 1880 by Dreer. It was a selection from Philadelphia Extra Early. A single plant selection made in 1900 is basis of present stock, considered much improved. Eureka Extra Early was tested at this Station in 1886 and considered not distinct from Philadelphia Extra Early. The data for pods per vine, 4.60 and 9.40, respectively, for Philadelphia and Eureka Extra Early, and of peas per pod 6.01 and 6.35, show the latter to have been greatly more productive; and the same comparison holds for the early crops of the two varieties as grown here in recent years, Eureka being specially noted as one of the most produc-

tive in first picking of any Extra Early; tho the total crop, by reason of its short season, was only fair to good. In the Rural Experiment Garden it gave "most peas of any early round pea ever tried." Dreer says that it is also good for a late fall crop. It is a typical, decidedly short-strawed, productive member of the group, in season with most others, and ripening promptly.

The Dreer firm says in a letter, quoted under Extra Early Pioneer, that latter is synonymous with Eureka Extra Early; but they differed as grown here.

Extra Early Market. Refs. 210, 211; *S. Dak. Sta. Buls.* 85:5. 1904; and 91:4. 1905. Extra Early Market was introduced before 1889 by Thorburn. In 1896 it was tested in the Rural Experiment Garden; but the comparison was made with a wrinkled pea, Station, with which it agreed in season, and exceeded by one-fourth in yield; but it was equal in quality only to the best, smooth, extra early peas.

In connection with the South Dakota cooking tests, which sustained the last statement, data are given to show the variety not especially early, 2¼ to 2½ feet high, with 3-inch, moderately plump pods, often with 6 or 7 peas to the pod, which held a good color in cooking. As grown at this Station, it was very close to the group type in all respects except that the pods were more rounded at the ends than blunt; crop fair.

First and Best. Refs. 214-220; *Farquhar Cat.* 1892; *Tait Cat.* 1918. Syns. 20 (second), 98 (third), 131, 134, 135, 187, 216, 218, 220. First and Best possibly, but not certainly, traces back to Dickson First and Best; but many American references and synonyms seem to warrant listing the varieties separately. Leonard's First and Best of All probably varies only in the name. Almost no early descriptions of the strain are given, but it is considered "an improved type of Daniel O'Rourke," "of same type as Rural New Yorker," or "Rural New Yorker almost identical" and "Dillstone Early a sub-variety;" and was, therefore, a typical Extra Early at least as far back as 1889.

It has been grown here recently, from seed from three sources, differences in the listed names indicating possible differences between "First and Best," "Selected First and Best," and "Extra Early or First and Best;" but no distinctive characteristics were found for any of the three; nor any separating the group from others of the class. All were single-podded, only fair to good in yield, requiring about 56 days to first picking when sown April 27 or May 1.

Lightning Excelsior (Refs. 222, 223) was introduced by Wood about 1888. It has been grown here for four seasons since 1922, using seed obtained at two different times from the introducer. It appears to be a decidedly variant strain, though part of the differences may be accounted for by unlike dates of sowing and changed climatic conditions.

Seeds for the first strain were very bright cream over orange under color. Sown April 27 or May 1 in successive years the first strain gave edible peas in 57 days, was 2 to 2½ feet high; had abundant dark green to medium green foliage, not whitened and almost bloomless, with four leaflets: bore first flowers at 9th node, and mostly single pods, but a few paired ones, on rather long stalks, the pods being from 2½ to almost 3 inches long, hardly

plump, not filled to tip, with pointed to rounded ends, containing 6 or 7 rather large, round, light green peas; gave only a fair crop.

Seeds for the second lot were mostly dark cream in color but some were very light green over light to medium yellow under-color. Sown May 22 in both years, which should have given a much shorter period to edible maturity than for the other strain sown much earlier,¹ pods required the same time, 57 days to picking; the plants were only 1¼ to 1½ feet high, with less and lighter colored foliage, glaucous and distinctly whitened, often with only two leaflets; flowers began at the 7th node, were always single on short stalks, producing pods from ¾ to 1¼ inch shorter than those of the first strain, but plump, square-ended, and with one or two less peas which were smaller but decidedly more indented and of better color. The abundance of the small pods gave a better yield "good to very good" than that of the larger podded strain.

The earliness of one strain may offset the greater yields of the other.

John L. Ref. 229. This pea was said by its introducer, Hastings, to have produced from one peck of seed sown at St. Augustine, Florida, one bushel of pods in 30 days from sowing. This is the shortest growth period we find in any authenticated and reliable record, and also the most tropical location for such a test, the precocity and climate evidently having a very close relationship. John L., according to Hastings' catalog of 1924 has held the record of earliness since 1896, probably about the date of introduction. Grown at the Station it has proved almost identical with Iowa Challenge, but with shorter stalks and seed somewhat more wrinkled and pitted. It also, in the north, ripens its crop slowly, edible pods being found for five weeks.

Sunol. Refs. 230; Mich. Sta. *Buls.* 120:24. 1895; and 131:31. 1896; N. J. Sta. *Rpt.* 19:147. 1898; Allan *Cat.* 1913-14. Sunol was introduced in 1893 by Allan, who is said by Gregory to have "produced more new peas than any one [else] on this side of the Atlantic."

Early descriptions picture a semi-dwarf vine, 1½ to 3 feet high, sometimes branched from the base, a very early but rather shy bearer of pods 2 to 2½ inches long, round, nearly straight, usually "rounded out" at point, with 5 to 6 rather large peas which change to light-cream colored seed, slightly dented and pitted.

These characters were nearly all the same for the variety grown here recently for two seasons; but the vines were still more dwarf (1¼ to 1½ feet), yield of pods "good," but pods short (1¾ to 2¼ inches), and rather poorly filled, with rounded to blunt ends.

Among earliest of varieties, but otherwise not to be recommended.

Extra Early Pioneer. Ref. 231. Extra Early Pioneer was introduced by Dreer,² prior to 1894, who claimed for it remarkable earliness, with pods of medium size and peas of fine flavor.

Tests of it made here, during two seasons, with seeds from the same source and sown at the same time as those of Sunol, show it from two to four days later than that variety. It was, however, decidedly more productive, ranking among the best of the Extra Earlys in this respect because of the numerous, well-filled, blunt- to square-ended pods, slightly longer than those of Sunol. The picking season was short. The vines were 2 to 2¼ feet tall, with dark green, glaucous foliage, so much whitened as to appear lighter.

Other peas showed a week or ten days difference in time of maturing in favor of late sowing.

Letter from firm, Dec. 8, 1926, says Pioneer was synonymous with Eureka Extra Early; but date of introduction lost by destruction of old records.

Lightning Express. Ref. 232. The first record we find of Lightning Express is in Buckbee's 1894 catalog, who probably introduced the variety or gave it the name, shortly before that date.

As grown here for three seasons it was a dwarf, distinctly early, rather uneven-podded strain, the pods ranging from 2 to 2¾ inches in length, and from medium to plump in width; in other respects a typical Extra Early. One crop was checked good, and two very good.

Prolific Early Market. Refs. 241-243; S. Dak. Sta. *Bul.* 85:5. 1904; Darling & Beahan *Cat.* 1913; Allan *Cat.* 1914; Rice *Cat.* 1913. In a letter to Maule in 1901, Keeney says: "About 10 years ago the writer selected a very prolific plant of an extra early pea, having a very long pod," from which Prolific Early Market resulted. First and Best, according to another authority, was the "extra early pea;" of which the new one is a very productive strain.

Descriptions made previous to its growth here say it is the most productive white-seeded extra early, with from 40 to 50 pods on many vines, three or four days later than the old Extra Earlys, about 2½ feet high, with light green, straight, round, saddle-backed, square-ended pods, 3 inches long, averaging about 7 peas, which when dry are of light cream color, round and smooth.

As grown here for three seasons the vines were not quite so tall and were unbranched; the foliage was medium in amount and medium green in color; the pods 2½ to 3 inches long, the peas whitish green to light green in color, 6 to 7 in pod; and the seeds were occasionally slightly flattened from pressure in the pod, and some were shaded green. As when introduced, it was a second early; but it matured its pods promptly. It seemed to have lost some of its former productiveness.

Prolific Extra Early, as listed by Burpee, described by Denaiffe, and grown here for three seasons, is apparently the same as Prolific Early Market. Prolific Early, listed by Farquhar in 1904, may be different, but data given do not suffice to say.

Rice Extra Early. Refs. 244, 245; and Rice *Cats.* As indicated by the name, this strain of Extra Early has been distributed by Rice, since before 1901, both for market gardeners' and canners' use. It is continuously re-selected and kept uniform in type.

As grown here it was 2¼ to 2½ feet high, with a few basal branches; abundant foliage rather darker in color than medium green, slightly glaucous; flowers at 8th to 10th node, practically always single; pods seldom reaching 3 inches, very plump, often saddle-backed, blunt to square-ended, well filled with 5 to 6 peas, between light green and medium green in color, rather large for the type, grading about the same as Alaskas for canning; seeds slightly pitted. Same season as Alaska and about the same in productivity.

Monster Podded Extra Early, with pods said to reach 4 inches in length, is similar to the above except in slightly greater height, and larger pods and peas.

First Early. Refs. 246; Portland Seed Co. *Cat.* 1909. This pea is described by Griffith and Turner in 1902, but does not appear in Tracy's bulletin listing varieties of 1901, so it was probably introduced in 1902. No record, other than in the introducer's catalogs, has been found, but it was grown here in 1922, 1923 and

1925. It differed in no material respect from Rice Extra Early; but the pods were somewhat shorter, and not quite so plump, resulting in distinctly smaller peas and seeds, but the yield, owing to a longer picking season, was as good, if not better. The second reference says this is the first early round pea with the sweetness of the wrinkled varieties. The quality was not tested here.

Saxonia. Refs. 256, 257; *Allan Cat.* 1913-14; letter from Allan, Nov. 22, 1926; *Jour. Roy. Hort. Soc.* 36:723. 1910; letter from J. M. McCullough's Sons, Nov. 1, 1922. Saxonia was advertised in America about the same time, 1912, by two western seedsmen, both of whom speak of it as new. The Allan Seed Co. says in a letter that its seed of Saxonia came from David Sachs, Quedlinburg, Germany, probably the originator. The company grew the pea for several years but discontinued

it because of small demand. This is probably the same as the Saxonia tested in the garden of the Royal Horticultural Society in 1910, which is similar in many essentials, but seems to differ in others.

The American Saxonia was described as a strain of Extra Early maturing about the same time as First and Best, free from "wild" (degenerating) tendencies, about $2\frac{1}{2}$ feet high, very hardy and vigorous, with pods $2\frac{3}{4}$ inches long or more, slightly curved at tip, generally in pairs.

As grown here in three recent seasons it was an early, not earliest, rather dwarf type, unbranched, with pods often larger than most Extra Earlies ($2\frac{1}{2}$ to $3\frac{1}{4}$ inches), but somewhat uneven, slightly curved, rounded at the ends, not very well filled, with 6 to 7 peas when well grown, which are rather large, more or less oval longitudinally, and light green in color. It was fairly productive. The blossoms are sometimes in pairs, the pods are rarely so.

Ohio Chief is a synonym of Saxonia.

TOM THUMB GROUP

The Tom Thumb peas, as the name indicates, are very dwarf in plant, now rarely exceeding a foot in height, especially on lighter soils. In the history of the type variety, however, several peas are included that were originally of medium height, or even tall, but closely connected, historically or through synonymy, with the Tom Thumbs of England or America. Other varieties are grouped here, also, that differ in many respects from the type, and have little historical or other connection with the Tom Thumbs; but all are white-seeded, dwarf or semi-dwarf, second early or midseason peas, often with white or whitish pods, sometimes with pointed or rounded rather than the more common blunt ends, short to medium length, rather broad and generally quite plump.

MAJOR VARIETIES IN TOM THUMB GROUP

Spanish Dwarf. Refs. 1-6; *Lawson Agr. Man.* 76. 1834. The first direct reference found to Spanish Dwarf is an American one; but it was undoubtedly known long before 1827 in England and France, since the earliest references in these countries speak of it as a long-established variety. It was grown for many years in America. Burr described it in 1863, speaking of it as a favorite in small gardens, but inferior in quality to Burbidge Eclipse or Bishop Long-pod.

It was very dwarf, variously said to be from 9 inches to 2 feet tall, with erect stems, often with spreading branches from near the base, to which it owes the synonym Dwarf Fan, having short, strong internodes, small, dark green leaves, strong tendrils, short petioles and peduncles, flowers mostly in pairs, producing short, broad, slightly flattened, but well-filled pods. It was a second early or midseason pea and a fair to good cropper. The peas were only fair in quality and the seeds small, smooth and white.

Bishop Dwarf. Refs. 11-16; *N. Y. Sta. Rpt.* 3:252. 1885; *Vilmorin-Robinson Veg. Gard.* 510. 1920. As with its probable parent, Spanish Dwarf, we find Bishop Dwarf first referred to in an American catalog; but it originated near Perth, Scotland, in 1825, being discovered, as a single plant in a field of Spanish Dwarf, by David Bishop. It was listed in several American catalogs previous to 1845, and was grown at this Sta-

tion as late as 1884, when Prof. Goff spoke of it, as an "old variety, not much grown at present."

It was very similar to Spanish Dwarf, varying in height like that variety and occasionally with two main branches from two joints below the flowering node which grew almost as tall as the main stem. The pods were said to be $2\frac{1}{2}$ inches long, quite characteristic in shape, enlarging progressively for one-third their length, then remaining of same diameter almost to the square end. In its early history it was very productive, bearing paired pods, ready from midseason on, with 7 small peas; Prof. Goff found it a poor producer. It was generally quite inferior to its successor, Bishop Long-pod. Prof. Goff in 1884 also described an "Early Dwarf," evidently from seeds furnished by Vilmorin, which from its synonyms, Nain hâtif and L'Evergne (undoubtedly intended for L'Evêque, French for Bishop) and the description, could only have been Bishop Dwarf, tho its identity with the latter was not recognized.

Tom Thumb. Refs. 17-29. Tom Thumb traces to Flanagan's Early in England and Strawberry in America, though differing so greatly from these varieties that history, not characteristics, makes the connection apparent. Flanagan Early (earlier forms unknown though allied to the Frames) was cultivated in England before 1850; a white-seeded, straight-podded, mid-season pea, with a vine $2\frac{1}{2}$ to 4 feet tall; and from it developed a somewhat shorter-vined, earlier type, Ringwood Marrow. From Ringwood Marrow or from the original Flanagan Early arose, probably by selection alone, strains known as Beck Gem (first advertised in 1853), Turner Dwarf or Royal Dwarf, in which the length of vine was further reduced and the season slightly advanced. In 1858, a more improved type was announced by Paul as Tom Thumb; and Beck Gem in its improved form also received the same name; so that two types of Tom Thumb were in cultivation in England at the same time.

One or the other of these types, possibly both, were introduced into the United States by Landreth, about 1850, probably under the name Beck Gem; but later importations of the improved stock brought also the name Tom Thumb. The two strains and the name met in America a strain of the Strawberry pea, even more dwarf than the imported stocks, only 6 to 9 inches tall,

and with peas of fair quality altho those of most of the strains of Strawberry were inferior. References do not prove definitely that the name Tom Thumb was used for this or other strains of Strawberry before the stocks and name came from England; but rural periodicals, during the decade of the Civil War, were filled with assertions and denials of the identity of the "American Tom Thumb" with Beck Gem and the English Tom Thumb, and of the two latter with each other.

The two strains coming from England, under the influence of the hotter, drier days of our pea season became still further reduced in height and advanced in earliness. These strains undoubtedly became mixed, or confused, with strains of Strawberry, including the American Tom Thumb, and Barr Tom Thumb; and seed stocks of the American strains were, according to Burr, sent to England, crops grown there, and seed reimported to America. From this confusion, Tom Thumb became the group name of many strains of peas, all with more or less dwarf plants, stocky-stemmed, short-jointed, usually branched but sometimes not, second early, with small, dark green foliage, and fairly large, straight or very slightly curved, rounded to blunt ended pods, which contained small, round, cream colored or yellowish seeds. Several peas of the same or very similar characteristics have been developed in France, Germany and Holland, and names of these have been given by writers on the pea as synonyms of Tom Thumb.

Prof. Goff, in 1884, described Tom Thumb.

Height $1\frac{1}{2}$ to 2 feet but many strains much more dwarf; stem strong, much branched, with short internodes; foliage abundant, very compact, rather deep green, neither glaucous nor whitened, with upper leaflets smaller; peduncles 1 to 2 inches long; pods paired, lighter colored than foliage, 2 to $2\frac{1}{2}$ inches by $\frac{1}{2}$ inch; peas 4 to 6, whitish green, compressed when full grown, about $\frac{3}{8}$ inch longest diameter; seeds cream colored, roundish, very smooth, $\frac{1}{4}$ inch in diameter, with radicle showing distinctly, and weighing about 117 to the ounce. It was prolific, rather early, and ripening over a long season.

In England Carter's Improved Tom Thumb and Sutton's Long-podded Tom Thumb were found in trials of the Royal Horticultural Society, late in the "60's," to be no improvement over the original Paul's Tom Thumb. In America, however, an Improved Tom Thumb, introduced about 1885 by Gregory, had considerably taller vines, was much more productive than the common strains, a few days later, with larger, better filled pods, resembling those of the old Bishop Dwarf; that is, longer, tapering for one-third length, then rather broad to tip.

Tom Thumb as grown at Geneva 3 years: Plant 10 to 15 inches tall; stem stout, erect, oval to angular, smooth, with very short internodes and a few basal branches; foliage abundant, dark green, very slightly glaucous, with 2-4 medium sized rather broad leaflets, and much larger, lightly clasping, slightly whitened stipules rounded at the tips, and bearing a few irregular teeth toward base; flowers from 7th or 8th node, numerous, medium to large, white; pods usually single, occasionally in pairs, on long, rather thick stalks: $1\frac{1}{2}$ to 2 inches long, narrow, plump, smooth, round, slightly curved, regular, filled to edge but often not to tip, end blunt to square when well filled, sometimes with short straight tip, sometimes without, lighter in color than foliage; peas 5-6, uniform, whitish green to light green, smooth to slightly indented, oval; of poor quality, being starchy, dry and rather tasteless; seeds smooth, round, medium to small (135-145 to ounce), grayish or bluish cream, sometimes tinged green, cotyledons light yellow to light orange; radicle moderately distinct. When sown early ripens in 56 to 60 days, cropping 18 to 21 days; fairly productive, or even good yielder for so small plants. Can be grown in rows 10 to 12 inches apart. Does best on heavy soils and reported well adapted for winter sowing in south; but in New York too poor yielder and peas of too poor quality to permit recommendation. Improved Tom Thumb is also still cataloged and grown, tho not extensively.

Bishop Long-Pod. Refs. 31-35; McIntosh *Bk. Gard.* 2:55. 1855; Hovey *Cat.* 1859; Burr *Fld. Gard. Veg.* 523. 1863; Thompson *Gard. Asst.* 319. 1859. This pea, known in England before 1850 and commanding favor for a long time, originated, according to Thompson, with David Bishop, as a cross between Bishop Dwarf and a marrow pea. It was soon tested by the Horticultural Society of London and found much superior to Bishop's older pea; and this view was sustained by later trials by the Society and in this country. It came here within a decade of its origin and was still grown in America at least as late as 1902.

It was tested and described at this Station in 1884, and again in 1926, the latter under its French synonym, from seeds grown by the U. S. Department of Agriculture at McMillan, Mich., which probably traced quite directly to France. The differences in the variety, grown more than 40 years apart, were surprisingly few, the most noticeable being a decrease in length and width of the pods in the late test with an increase in plumpness.

In this test the plants were 2 feet tall, branched at the base, with dense, medium green foliage, slightly whitened, generally paired pods, borne on 7th to 9th node, ready as second early, lighter in color than the foliage, $2\frac{1}{2}$ - $2\frac{3}{4}$ inches long, medium to plump, straight, with blunt to square ends, less pointed or rounded than most others in the group, and with 4 to 7 peas in the pod, of medium size, whitish green in color and of fair quality. Now seldom grown either in America or England, but listed in French and German catalogs.

MARROWFAT GROUP

The name Marrowfat, as applied in America, refers to an entirely different type of peas from those now known by the name in England, altho the early use of the term was the same in the mother country as on this side of the Atlantic.

General characters of American Marrowfat peas. The group here discussed includes, in the main the white or yellow, smooth peas used, largely

in the dry state, for soup-making and cooking or baking with pork or bacon. They are mostly midseason to late, tall and rather heavy in vine, with many branches in the type group, but with none in many allied varieties, bearing the first flowers and pods high up on the stem, the latter usually single on long, thick stalks, broad, square-ended, often becoming quite plump before the peas are of edible size, ordinarily rather few on the vine,

but containing, when ready to pick, 5 to 7 or more large, oval, light green to good green peas, much better in quality than the smaller peas of the Extra Early group. The seeds are usually half larger to nearly twice as large as those of the Extra Earlys, more nearly round than are the green peas, usually with very smooth skins, tho often more or less angular or irregular in shape, and occasionally dented.

Included in the group of Marrowfats, also, are black-eyed types, with seeds generally smaller than those of the white group, each seed showing a distinct, small, black, or very dark brown, spot around the hilum or eye. The black-eyed peas and the small-seeded and more or less dwarf types of the white-seeded Marrowfats are more generally used for field culture than for the garden or market.

History.—The history of the varieties of this group involves so many complexities that no really satisfactory summation of it can be made.

First, the earliest English classifiers of peas of whom we know, Gerarde (*Herbal* 1597) whose separation is very general, and Parkinson, give so little detail for groups that their characters and their relationship to each other are very uncertain; and the varieties included in each are not specified. Their "Rounceval pease" and "White Rouncivals" might be considered the ancestor of the Marrowfats; but Mawe-Abercrombie, writing a century and a half after Parkinson, includes in one rather indefinite group, two types of Marrowfats, Tall and Dwarf, and the white Rouncival, as currently cultivated, thus indicating that at that time the Marrowfats and Rouncivals were considered distinct. Others believe the Rouncivals to have been wrinkled peas. Parkinson's Hasting pea is excluded from consideration, by its lack of hardiness, as ancestor of either the Extra Earlys or the Marrowfats, since both stand cold well; and by its earliness, also, as progenitor of the Marrowfats, in particular, since these are midseason peas, or later.

The Egg pea, though corresponding in many respects to the Marrowfats, was not listed by Parkinson, and was in any case a black-eyed variety, and so hardly in ancestral line with the white-seeded type; and the seeds differ greatly both in size and shape from those of Black-eyed Marrowfats.

Later, the history of the Marrowfats is still further complicated by the English use, beginning at an unknown date or period, of this term to cover the tall, wrinkled, rich-flavored white and green peas of which the Knight Marrows are typical examples. This double use of the term in English pea history, without definite indication of the time of change, makes it impossible to say whether many varieties called Marrow or Marrowfats during the middle half of the nineteenth century were smooth or wrinkled peas.

American seedsmen, importing varieties from England, brought with the peas the name or the classification as Marrowfats, even though the seeds were wrinkled and green; and the brief catalog descriptions, emphasizing season, pod shape and pea quality, rather than seed

characters, left no printed clue to aid in the fundamental grouping of varieties.

The earliest references of which we can be positive, in Marrowfat history, are Townsend's naming (1726) of Black-eyed Marrowfat and the phrase in Stephen Switzer's Catalog for 1731 [reprint, only, seen]: "For the third sowing Marrowfats," which would indicate that even then they were very well known, needing no description. These are followed by the Mawe-Abercrombie reference to Tall and Dwarf and Large White marrowfats. These names, with various slight changes and additions, such as Early and Royal have come down to us from those remote times, and are so interwoven that it is out of the question to straighten the tangled thread of their history. Switzer also noted Spanish Mulato and Nonsuch which apparently belong in this group and Mawe-Abercrombie lists Egg and Crown. Lady Finger was also very old. Russell in 1827 places Marrowfat in America. During the succeeding century, about 50 more varieties or names were added to the smooth marrowfats.

MAJOR VARIETIES IN MARROWFAT GROUP

WHITE SEEDED SECTION

Tall Marrowfat. Refs. 3-10; Booth *Cat.* 1810; Lawson *Agr. Man.* 78. 1834; *Gard. Mag.* No. 77. 1836; Rogers *Veg. Cult.* 230. 1839. It is impossible to fix certainly upon any ancestor for the white-seeded Marrowfats, altho White Rouncival is given as a synonym by several authorities, but this is doubtful; or to separate the individual members of the group.

The earliest specific reference to Tall Marrowfat, after its listing by Mawe-Abercrombie, is in the catalog of Wm. Booth of Baltimore; and it was, and still is, given a more prominent place by seedsmen on this side of the Atlantic than in England. It was generally recorded as being 6 to 7 feet tall, seldom branched, decidedly later than the so-called Dwarf Marrowfat, with large, broad pods containing from 7 to 9 large peas of excellent quality, a fair to good bearer and lasting over a long season. One authority says seeds more spherical than those of the Dwarf Marrowfat, less wrinkled, and when compared in bulk, smoother and more glossy; while another says seeds are more oval.

The tall type was not grown in the early tests of varieties at the Station, but trials of several Marrowfats have been made recently, under slightly varying names and from seed supplied by different seedsmen, all but two proving practically identical in seed size, shape, color and surface; in height of vine; in showing basal and medial branches instead of being unbranched; in season (70 to 80 days to edible maturity, according to time of sowing and weather conditions), in size and shape of pods and peas, and in general crop production.

Two lots of seed, however, both called "Marrowfat" only, one from the Idaho Station where it had been grown in field culture, and one from a southern seedsmen, were decidedly earlier than other strains sown at the same time, started flowers and pods lower on the vine, and contained about one more pea to the

pod in pods of the same size and shape, making both peas and seeds smaller and somewhat more wrinkled. These two strains correspond, in seed characters, more nearly to the descriptions of Dwarf Marrowfats, but the vines were as tall, if not taller, than those of the other strains. If differences associated with Tall, Large, and Dwarf strains ever existed, they have either disappeared or no longer follow the names.

For future reference, a rather detailed description of what seems a good strain of White Marrowfat peas is here given: Seeds uniform, smooth, round to oval, large (80 to the ounce), whitish cream in surface color over orange cotyledons, and with prominent radicle; stem averaging 5 feet in height when first pods ready, adding length later, moderately stout but requiring support, angular, with short to medium length internodes, and from few to many basal and medial branches; foliage abundant, dark to medium green in color, with little bloom on leaflets but considerable on stipules; leaflets usually four in number, large to medium in size, long to medium in shape; stipules from slightly to considerably larger than the leaflets, of the same color and not usually whitened, moderately clasping, and with teeth about one-third distance from base to rounded tip; tendrils not characteristic, moderately prominent; flowers begin about 18th node on unbranched stems, white, borne on long, stocky peduncles, both singly and in pairs. The pods, also, are often in pairs, on thick stalks, with medium sized receptacles and straight, long, rather narrow, flat sepals; are from 2 $\frac{7}{8}$ to 3 $\frac{1}{2}$ inches long, broad to medium in width, moderately plump, considerably wrinkled, round to oval in cross-section, very straight or slightly recurved, regular, filled to tip and edge, blunt to square at the end, with a distinct, straight tip; of lighter color than the foliage (light green to whitish green); and contain 5 to 7 medium to large, round, smooth, whitish green peas, of fair cooking quality, rather better than Extra Earlies. Sown April 27 in a cool, moist season, the strain produced edible peas in 72 days and other pickings for two weeks, giving a "good" crop. Other strains were ready for picking in from 70 to 81 days; but sown three weeks later in a warmer, dryer season, pods were ready in two weeks less time, and the difference between the strains practically disappeared.

Large White Marrowfat. Refs. 3, 11-13. Since Large White Marrowfat was mentioned by Mawe-Abercrombie with the tall and dwarf types, it is evident that there was some separation between the three at that time, but descriptions would not, now, allow of drawing any line between the large and the tall types, except that the former is usually given as about 5 feet tall instead of 6 to 7 feet for the latter.

Dwarf Marrowfat. Refs. 3, 4, 14-26; Booth *Cat.* 1810; Landreth *Cats.* 1824, 1832, 1892; Rogers *Agr. Man.* 228, 230. 1839; *Cot. Gard.* 25:291. 1861; *Gard. Mo.* 36:112. 1884. As with other types, a Dwarf Marrowfat may have been included in Switzer's "Marrowfats" and is certainly mentioned by Mawe-Abercrombie; while the subsequent references coincide closely with those for Tall Marrowfat, but are much richer in synonyms, which would seem to indicate a wider range of true varieties. Reading the descriptions, however, they agree noticeably in everything but height, and the heights differ so widely where a strain under a distinctive name is grown in different localities or in different seasons, that we are able to segregate very few real varieties, or find that these varieties no longer maintain their identities.

The Royal Dwarf group appears for a time, at least, to have approached true dwarfness, but we have been

unable to find a strain grown by present day seedsmen that is much below our limits for tall peas, 3 $\frac{1}{2}$ to 4 $\frac{1}{2}$ feet as grown under Station conditions. Brown Dwarf Marrowfat, as described by Gregory and Landreth, was even more dwarf in its early history, less than 2 feet, and occasionally only a foot and a half; but Goff in 1884 gave both Royal Dwarf and Brown New Dwarf Early Marrowfat as synonyms of the variety he grew and described as White Marrowfat, which ran from 3 to 5 feet in height. His description for this variety differs in none of the other characters given from our detailed description under Tall Marrowfat. Rogers says as far back as 1839 that Dwarf Marrowfat is wrongly named, as 4 to 5 feet in height, but had been so called for a century; and that it is nearly extinct in true form, those sold for it being taller and having rounder and smoother seeds, those of the original type being much larger, with a rough coating.

American Dwarf, listed in England in 1841, is evidently one of our native forms, 3 feet tall, and said to be very good, a good bearer, and about a week later than Bishop Long-pod. This tendency to increasing height, decreasing size of seeds and smoothing out of the seed coats is inherent in the Marrowfats, and only most careful selection and roguing will maintain anything approaching true dwarfness. The inferiority of the Marrowfats in quality as compared with the newer wrinkled peas has decreased their popularity and so lessened the attention given the breeding of seed stocks.

Victoria Marrow. Refs. 59-64; *Country Gent.* 18:190. 1861; Burr *Fld. Gard. Veg.* 550. 1863; *Ann. Hort.* 125. 1889. Rogers in 1839 says that Royal Victoria, later given as a synonym of Victoria Marrow, was recently introduced, but the latter name does not appear until 1844, and seems to have been first listed in America in 1859. The variety, under various names, soon spread widely in England and crossed to France. It remained in cultivation in America for at least thirty years; and seems to have been one of the best of the Marrowfat group, with very large pods, generally paired, produced abundantly before or in midseason and containing 5 to 8 large peas. It was of the unbranched type and bore its pods well toward the top of the stem, above the 14th or 15th node and occasionally noticeably clustered. The seeds were sometimes distinctly shaded olive or greenish, and often indented as tho inclined to wrinkle, these characters accompanying better quality.

Grimstone Egyptian. Refs. 66, 67; *Jour. Hort. Soc. Lond.* 4:270. 1849; *Gard. Chron.* 27:236. 1886. About 1845 Grimstone claimed to have come into possession of some peas found in the dust of an hermetically sealed Egyptian vase presented to the British Museum by Sir Gardner Wilkinson, and supposed to be 2844 years old. These were advertised by Farnes in 1846 as Large New Mummy, and in 1848 some of their original seeds or their progeny were presented by Grimstone to the Horticultural Society of London for testing. The resulting plants did poorly, but seemed



Typical vine and pods

EXTRA EARLY AND ALASKA TYPES

(Two-thirds natural size)



so similar to those of Dwarf Branching Marrow that in 1849 the new-old variety was grown beside the well-known one, when no differences could be detected in growth, foliage, flowers, pods or seeds. The description secured at that time makes the variety about 2 feet tall, with strong, short-jointed, stems, broad leaflets, large cream-colored flowers on short peduncles, nearly straight, "flattish" pods, ready in 103 days (rather short period) from Mar. 21, moderate in number, and each containing about 6 medium-sized white seeds. This description, with others previously given of Branching Marrow, makes Mummy a marrow-like variety; but the name is also connected with Rose or Crown, which had forms with white flowers and seeds and with bi-colored flowers and dark seeds.

The Andersonian Mummy, noted in an American periodical, is there said to have originated from peas collected in Egypt and supposed to be 2000 to 3000 years old, which were given by a Gen. Anderson to John Gardener of Guernsey and increased by him. This, also, is said to have been tested by the Horticultural Society of London, but the reference may have been, by error, to the tests of the other Mummy, if there were really two of them. The Mummy and Crown peas grown in America, especially in Canada, have been considered field peas.

Paradise Marrow. Refs. 70-72; Thorburn *Cat.* 1861; *Country Gent.* 20:126. 1862; *Jour. Hort.* 48:380. 1872. Paradise Marrow, Excelsior Marrow and Champion of Paris were introduced successively in 1851, 1857 and 1860, by Stuart and Mein, Wm. Knight, and Sutton, respectively; but by 1861, these names, with several variants, were regarded as synonyms. The variety was grown in America under all three names.

Hogg, in 1873, commended Paradise Marrow very highly.

It was a strong-growing Marrowfat pea, 5 to 6 feet tall, single stemmed or occasionally branched at the top, edible in second early or early midseason with pods which averaged 8 to 10 to the vine, were usually single, 4 inches long, straight or slightly curved, very broad, filled well but slowly, rather whitish, and contained 7-9 large peas which became large, uneven, compressed, irregular or egg-shaped, whitish seeds, with a thick, smooth skin.

From its earliness, productivity and large size of pods, peas and seeds, it was considered much superior to the Early Frame types, to Auvergne, and to Shilling Grotto.

Missouri Marrowfat. Refs. 21, 74; Burr *Fld. Gard. Veg.* 543. 1863; Ferry *Cat.* 1873. Tho usually considered synonymous with Royal Dwarf Marrowfat and a sub-variety of Large White Marrowfat, Burr calls Missouri Marrowfat a variety of American origin; and describes it as:

Medium height for a Marrow, strong and vigorous, usually single-stemmed, but occasionally branched; with single or paired pods, nearly straight, wrinkling on the surface as they ripen, and containing about 6 large peas which change to seeds larger, paler, more wrinkled and much more regular in size than ordinary types. It gave edible peas in about 75 days from May 1 and was very productive.

Leopold II. Refs. 77; N. Y. Sta. *Rpt.* 3:250. 1885. Leopold II is an old pea of unknown origin, but firmly fixed and easily kept true to type. In its light-colored pods with very dark green sutures, it is similar to Ringwood Marrow, a variety connected with the history of Tom Thumb. Its greater height of vine removes it from that group, the later season and rounded ends of the pods exclude it from the Extra Earlies, and the straight pods prevent classifying with Scimitar type peas.

In our tests it grew 3 to 3½ feet tall, the pods are often paired, 3 to 3½ inches long, broad, with a very heavy, wide straight tip, containing 6 or 7 peas, rather more like those of the Extra Earlies than typical Marrowfats. The variety is noticeable for the rapid tho late blossoming and quick filling of the pods, so that the crop can all be harvested within two weeks. The light color of the pods counts against them, tho the peas really hold freshness very well.

Marblehead Early Marrowfat. Refs. 80, 81; N. J. Sta. *Rpt.* 149. 1898. This selection from White Marrowfat was introduced by Gregory about 1890, who said it had been grown by the (unnamed) originator for 50 years.

As first grown it was probably shorter in vine, with moderately long, very plump, blunt-ended pods, uniformly filled with 6 to 8 peas and quite early. As grown in Kansas in 1898, and recently at this Station for three years, it showed no outstanding characteristics to separate it from the other Marrowfat strains. The pods were possibly somewhat longer, on the average, broad rather than plump, square-ended, and small-tipped, with 7 to 9 peas. It was not specially early, 62 days to edible maturity from a very late sowing, 10 to 12 more from earlier seedings; and was nearly, if not quite, as tall as other strains.

Improved Sugar Marrow. Refs. 84-86; Allan *Cat.* 1913. The Improved Sugar Marrow probably originated sometime previous to 1905, as it was mentioned in several places that year. It was grown here for two seasons; and was practically indistinguishable from other Marrowfat strains, tho two distributors say it is quite unlike Royal Dwarf, White-eye Marrowfat or Black-eye Marrowfat.

It gave a good to very good crop of quite long, moderately plump pods, very slightly curved, with blunt to square ends, containing 6 to 7 large, round oval, medium green peas. In Kansas tests the peas were found of rather poor quality, not bearing out the "Sugar" of the name. The seeds are small, cream-colored and slightly pitted.

It seems to be a favorite in the South, being much grown around Baltimore and Norfolk.

BLACK-EYED SECTION

The Black-eyed Marrowfat peas are probably fully as old as the solid white types. In 1726, Townsend, an English seedsman, spoke of the variety Black-eyed Marrowfat. Switzer, in 1731, mentioned at least two peas which evidently belong in this group. In describing these and other early varieties of the type, it is very doubtful that the chronological order given is correct. The Black-eyed Marrowfats are now very seldom grown in the garden; but in certain sections are leading members of the field-pea group; and are used for soup-making and baking as well as for stock feed.

Egg. Refs. 91-95. The Egg pea, tho exceedingly old, still exists. It was grown at the Station in 1926,

from seed raised on the U. S. Dept. of Agriculture test grounds at McMillan, Mich., under the name *Bohnen-erbsen*, which is the German for "Bean pea," one of the synonyms of Egg.

Old descriptions make the vine as tall or taller than the Tall White Marrowfat, but as grown here it was the same height or a little shorter, rather strong growing, with a few basal branches and dense foliage; flowered low, 10th-11th node, and bore a very good crop of pods, of narrow type in general, but with rounded rather than blunt ends because of failure of the pods to fill well. They averaged only 3 peas (2-6); but these were very large, flattened, oval, oblong, egg-shaped, or short kidney-bean shaped, attached at one end. The seeds were brownish, or greenish cream, somewhat wrinkled, and showed plainly the black hilum, making a pea too characteristic in shape and marking to be mistaken for any other.

The variety was pronounced worthless in England 75 years ago, tho previously useful as a "poor man's pea." That it has been continued, except as a curiosity, must be ascribed to the different taste of certain continental European peoples, who grow in quantity many

peas hardly considered edible by the English and Americans. So far as records show, except on trial grounds, the Egg pea has never been grown under that name in America; but the *Southern Cultivator* in 1847 mentions Patagonian, which is synonymous with Egg.

Black-eyed Marrowfat. Refs. 102-110; Mich. Sta. *Bul.* 131:30. 1896. The application of the descriptive name for this type of pea seems to have been more common in the United States than elsewhere; and the particular strain here discussed may have originated in America, tho the Michigan reference says it was introduced from England by Thorburn.

It is similar to the shorter-vined White Marrowfats, except for the black eye, smaller size of the seeds and slow maturing. Now used almost exclusively for field culture. Two strains of it grown here varied somewhat in size of seeds sown; but the resultant crops were practically indistinguishable.

ALASKA GROUP

General Characteristics.—Alaska peas and others of this group are, in the main, green-seeded Extra Earlies. The slender, unbranched or slightly branched stems of moderate height; light green to medium green foliage scanty to medium in amount; the four small leaflets, and the moderate-sized, only slightly whitened stipules; the small creamy or greenish white flowers borne at and above the 7th or 8th node; and the short to medium length, round, plump, blunt-ended pods, are so like those of the Extra Earlies that the similarity has led to considerable duplication of synonyms between the two groups. Authorities on the pea, basing their decisions on the varieties in the field, and not knowing, or forgetting, differences in the color of the seeds, have occasionally pronounced Alaska or some other well-known variety in its group identical with other varieties in the Extra Early group, or vice versa. The two groups are alike in season, also, both very early. Sometimes one color of seed, sometimes the other gives the earliest marketable pods; but the peas of Alaska and its allies usually have more of the characteristic "pea" flavor, are sweeter, and perhaps more tender than those of similar cream-seeded types. The green-seeded smooth peas are almost always selected for canning, the cream-seeded types, rarely. Neither type, except for mere earliness, is worth growing in private gardens.

Whether the seeds of the Alaska group be called blue, as they generally are in England, or green, depends quite largely on the eye of the observer; but in some strains the seed coats separate more completely than in others from the underlying green cotyledons; and the intervening partial or complete layer of air "blues" or "whitens" the peas, just as in the cream-seeded types similar differences in the amount of separation lead to distinctly salmon-colored coats adhering quite closely to the orange-colored cotyledons, or to almost white peas where the layer of air shuts out the underlying color.

The modern types of Alaska show, also, considerable pitting, even wrinkling, of the seed coat, usually an index of better quality in the peas. This index is not always an accurate one, particularly in the case of crosses, as several canning peas, apparently well wrinkled, are little if any better in quality than the smoother Alaskas.

History.—The connection of Alaska with any of the old named types of peas is not so evident as that of Extra Early with Fulham peas, Hotspurs, Charlton and Early Frame.

The "green Hastings" mentioned by Parkinson in 1629 seems to have been too tender to cold to have been the ancestor of our very hardy, smooth-skinned, green peas; and the "Rouncivals" too broad-podded and too tall. For more than a century and a half no other pea that could be the source of Alaska seems to be recorded. In 1778 Mawe-Abercrombie mentions "Green nonpareil" which name was later repeated as a synonym of Woodford Green Marrow; and the latter is undoubtedly in the line of descent of Alaska-type peas. Woodford Green Marrow was said to degenerate into Blue Prussian, "from which it evidently was derived;" but whether Blue Prussian was also an ancestor of the original Nonpareil and so a grandparent, many times removed, of Alaska, is unknown. We can find no record of the time of introduction of Blue Prussian into England from the Continent, which was undoubtedly its original home. The earliest references speak of it as an "old and popular variety" and it carried many synonyms; so it is quite probable that it came to England at a very early date; and selections from the dwarfier forms of it may well have been developed into Nonpareil. If, however, Blue Prussian was not in England before Nonpareil originated, there must remain a missing link in the chain which connects Alaska with the early English peas; for the order could hardly be reversed, in spite of the apparent succession

of recorded dates, and Blue Prussian be a descendant of Nonpareil. Giving Blue Prussian priority in date would lead to a chronological succession of leading varieties essentially as follows: Blue Prussian, Green Nonpareil, Blue Imperial, Woodford Green Marrow, Flack Imperial, Kentish Invicta, First Crop Blue, Earliest of All, Alaska, Earliest Blue, Rogers Winner, Rice No. 330, Horal, Hustler and Market Surprise(?).

MAJOR VARIETIES OF ALASKA GROUP

Blue Prussian. Refs. 3, 5; M'Mahon *Amer. Gard. Cal.* 311. 1806; *Gard. Chron.* 68, 198. 1850; *Cot. Gard.* 1:63. 1861; N. Y. Sta. *Rpt.* 3:259. 1885. Little is known of the early history of Blue Prussian, but the name indicates a Continental origin and its apparent relationship to some other varieties makes it probable that it was known in England long before any recorded dates for it.

It still survives but is now used almost entirely as a field pea; and it is described here, with several allied varieties, under the Alaska group, because it holds a somewhat doubtful position as a progenitor of peas of that type. In the first half of the Nineteenth Century it was a prominent variety both in England and in America, where it was listed as early as 1806; and it has been grown to some extent in France. In its earlier days it was used by market gardeners as well as for field culture but has apparently never been a garden favorite.

Older descriptions give it a slender, sometimes branched, not very robust stem, $2\frac{3}{4}$ to $3\frac{1}{2}$ feet high, with abundant dark green or "fresh" green foliage, the stipules being considerably whitened. Its medium-sized white flowers began about the 10th node, and produced a dozen or more pods, mostly in pairs, which were about $2\frac{3}{4}$ inches long, roundish or somewhat flattened, straight or slightly curved, with blunt to square ends when well filled, and containing 6 or 7 rather large, closely-packed, deep green peas of poor flavor. The seeds were small, whitish green or blue, round and almost smooth. It was late in season and very prolific.

Prof. Goff's description of Blue Prussian as grown at this Station in 1884 differs very little from the older ones.

Two strains of it, both from Idaho Station seed, were grown here recently, one strain being much superior to the other in vigor and productivity, tho quite similar in other respects. Characteristics of the better strain differed but little from those of the variety dating back 50 to 75 years; but the stems were not quite so tall (2 feet), pods not quite so long (2 to $2\frac{1}{2}$ inches), nor with so many peas (generally 5), the season somewhat earlier (75 days) and the crops hardly as good.

Recent French descriptions make Blue Prussian quite dwarf and stocky, with short-jointed, zigzag stems, very much whitened stipules, and more pointed pods, rather poorly filled.

In Canada, our Northwestern States, and in other scattered areas Blue Prussian is still one of the leading field peas.

Nonpareil. Refs. 2, 4, 11, 12; Booth *Cat.* 1810; *Gard. Chron.* 673. 1853; Va. Sta. *Bul.* 60:5. 1896; Tait *Cat.* 1913; and letter from Tait, Dec. 14, 1922. Nonpareil has at least left its name in the Alaska group; and if Blue Prussian is not its parent and so ancestor of the later varieties of the group, that credit must be given to Nonpareil, from the name alone, with Abercrombie's qualifying "green," for we have not a word

of history or a description of the ancient variety. The name recurs in connection with Woodford Green Marrow, which is undoubtedly in the line of descent of the Alaska peas, and in successive later references, Nonpareil was either name or synonym of varieties approaching nearer and nearer to what Alaska is today. These later Nonpareils are undoubtedly derived from Alaska or its immediate predecessors, rather than from the old Green Nonpareil, which has undoubtedly disappeared. They are recommended by the seedsmen who handle them as superior to Alaska in being earlier, longer podded and more productive.

Two strains of Nonpareil, one called Extra Early, were grown in the Station garden for two seasons, in connection with these trials; and one strain for two years in the field beside Alaska, for testing as a canning pea. The small differences indicated greater productivity for Nonpareil over some strains of Alaska; slightly greater than the average of all the Alaska strains used, but not above the best one or two strains. Pod lengths also showed similar variations but not so great as between Alaska and Large-podded and Long-podded Alaska. The seeds were usually smaller, ranging from 165 to 185 to the ounce.

The Nonpareils are now, therefore, merely good strains of the Alaska type. Pres. Jas. T. Moreland of Geo. Tait & Sons, Norfolk, Va., says their Nonpareil was a selection made about 1897 from an old pea "Victor," which was itself selected from Laxton's Earliest of All, thus confirming the supposition that the modern Nonpareils are closely related to Alaska.

Woodford Marrow. Refs. 4, 22-24, 26. By the careful selection necessary to prevent its degeneration into Blue Prussian, Woodford Marrow proves its origin in that variety. This was probably shortly before 1834.

From the description given, it was 10 days later than the parent variety and differed from it only in the better (dark bluish) green color of foliage, pods, peas and seeds, the latter being deeper in color than those of any variety then known. The plants often bore medial branches, which Blue Prussian lacks, the pods were broader and the peas too thick skinned to be palatable except when very young.

There seems, also, to have been a dwarf form a foot or so shorter than the type variety.

Woodford Marrow was listed in several American catalogs before 1850; but soon disappeared from cultivation, altho listed by Burr, 1863.

Flack Imperial. Refs. 27-31. Introduced about 1841 as Flack Victory, the name Imperial seems to have been more common for this variety. Like Woodford Marrow it is Blue Prussian in type, probably descending from it indirectly through Bedman Imperial, of which it was considered a great improvement.

It soon ran back to Blue Prussian unless carefully selected. It was earlier, robust in growth, more dwarf, more productive, and with larger pods, peas and seeds than preceding varieties of the group. The stems are always branched, the foliage dark green but distinctly blotched grayish white. The seeds were large, irregularly oval and dark blue. The earliest American references associate "Dwarf" with other names for the variety; but the reduction in height from English grown plants is probably due to changed climatic conditions.

Burr included it in his book in 1863 but no later references have been found, and it was not carried long

in England tho found in the Chiswick trials of 1860 to be the only Imperial "really worth growing."

Kentish Invicta. Refs. 34-36; and Bliss *Cat.* 1873. Kentish Invicta, possibly the immediate ancestor of Alaska, was raised in 1867 by Eastes, a noted Kentish grower of peas, and speedily earned the reputation of being the earliest blue pea. It came to America about 1873 and was soon quite widely cataloged and well distributed, if not extensively grown

It was tested for two years at this Station, and described in considerable detail in 1884. From this description it could hardly be distinguished from the Alaskas of today but was apparently somewhat taller, with rather lighter colored foliage, less uniform and prolific, and ripening more evenly.

It is still cataloged in England and on the Continent, but superseded in America.

Earliest of All. Refs. 40, 41; *Jour. Hort.* 2:132. 1881; N. Y. Sta. *Rpt.* 1:87. 1883, and 3:255. 1885. Earliest of All was announced in 1881 by Laxton as a Ringleader x Little Gem cross. General distribution of it began the following year; and seed of the variety was then offered in America. It was tested at this Station in the same year and quite fully described in 1884. It was said to be somewhat lacking in vigor and not prolific; but in every other respect was identical with two strains bearing the name that were recently tested here for two years. One of these strains carried "Alaska" as a synonym, and the descriptive sheet for this strain bears check marks identical with those for a typical Alaska grown at the same time from seed furnished by one of our leading and most reliable growers of canning peas. It is very evident that Laxton's Earliest of All furnished the seed, probably from selected, vigorous plants, on which stock later distributed as Alaska was based. The earliness of Laxton's pea is emphasized in English and Continental references of the time and later, with some hints of the lack of productiveness, was noted by Prof. Goff. Unfortunately we have no description of Alaska by Goff since he left the Station before the introduction of that variety. Other authorities maintain the identity of the two varieties; but it seems almost certain that Cleveland's Alaska was a selection from Earliest of All rather than a renamed portion of the parent stock. As the two varieties are so intimately connected, the detailed description will be given under Alaska.

Victor, an old pea listed by Tait, was a selection from Laxton's Earliest of All.

Eclipse. Ref. 42. Eclipse was introduced by Harrison (2) in 1882, and named from a famous race-horse. If it differs from Laxton's Earliest of All, it is only in very unimportant characteristics, such as a peculiarly light green stem and rather scanty foliage. These differences, also, seem to have disappeared by cultivation in other places or other seasons; for later English and French references speak of its extreme likeness to, if not identity with, Earliest of All, Express and Alaska.

As grown here from Idaho and British Columbia seed, it is a typical Alaska with a somewhat long stem.

The name is also said by Laxton to be commonly applied to the blue, smooth-seeded strain of his Harbinger. The variety is quite distinct from Burbidge Eclipse, which had green, but dimpled seeds; and from the wrinkled, cream-seeded Eclipse.

Alaska. Refs. 46-49; N. Y. Sta. *Rpt.* 5:248. 1887; also letter April 12, 1913, from W. W. Tracy, Supt. Testing Gardens, United States Department of Agriculture. The Alaska pea, in pure stocks, in many selected or degenerating strains, or in other varieties sold under the name, probably is the pea most extensively grown in America. Cleveland claimed to have originated the variety about 1880 as a selection from Kentish Invicta, but similarity of Alaska to Laxton's Earliest of All in the hands of other seed growers and testers make it almost certain that the American variety came, probably after considerable selection, directly from Laxton's pea.

The two varieties were grown under separate names for some time; but the widespread advertising of Alaska by Cleveland and by an agricultural periodical which distributed seed of the variety as a premium, made it so widely known that most growers of Earliest of All sold their stocks, at wholesale at least, as Alaska, though retaining both names either separately or as synonyms, in retail catalogs. The name Alaska was that of a steamship then holding the Transatlantic record.

The united stocks remained very pure and very uniform for many years, but then, through lack of careful selection, the type began to split up and degenerate, so that today there are almost as many strains of Alaska as growers of seed peas; and each strain, unless very carefully selected and rogued, contains many divergent types in greater or less proportion. The situation is further complicated by the practice of making up shortages in America of true Alaska stocks by purchase of seed of similar varieties, usually from England, for which substitution Clipper, Earliest of All, First Crop Blue, Nonpareil, Earliest Blue, Eclipse, Express (from France), and possibly other varieties have been used.

In tests of canning peas made here in 1924 and 1925, six strains of Alaska were grown side by side, which differed in productivity, in proportions of peas in different grades, and in computed financial returns, almost as much as though they had been distinct varieties. This makes it very difficult to give any description of the variety that would include only the better types of it, and would exclude poor types and similar kinds.

As grown in the garden in comparison tests, in a rather dry season when vines and pods were not as large as usual, one strain of very uniform type was checked on the descriptive blanks to give the following description:

The very dry seeds sown averaged about 150 to the ounce, the usual number being 130 to 140. They were uniform in size and shape, smooth but slightly pitted, round or occasionally indented, good light green in color, over green cotyledon color, with radicle showing plainly. Sown on April 27 or May 1, a picking of pods was ready in 55 days, or sown May 22 in 47 days, and other pickings



Pods at top of plant

HORAL

(Two-thirds natural size)



From imported seed; not acclimated

IMPROVED TELEGRAPH

(Two-thirds natural size)

could have been made for eight to twelve days, though practically all might have been secured within five days. The plants were $1\frac{3}{4}$ to $2\frac{1}{4}$ feet high, stems slender, angular but smooth-sided or slightly ridged above; internodes short to medium in length, nodes not prominent; branches lacking or occasionally few at base or below medial; foliage abundant, medium green in color, with little or no whitish blotching, and with slight bloom; leaflets 2 to 4 in number, medium in size and shape, stipules only slightly longer, rounded at the tip and with a few teeth at the base; tendrils inconspicuous; flowers cream colored, usually borne singly, beginning at the 7th to 9th node on peduncles of medium length. The light green pods (short by dry seasons) were from 2 to $2\frac{3}{4}$ inches long, medium in width, quite plump, smooth, round in section, straight, not constricted, with blunt to square ends, having a straight tip. They contained from 5 to 7 peas and held their freshness moderately well. The green peas averaged about 110 to the ounce, were smooth, round, and light green to whitish green in color. They are of excellent canning quality for a starchy pea and hold color well in the can.

Under favorable conditions Alaska yields well and gives peas that grade well for canning; but its great merit lies in its hardiness, permitting early sowing, and the earliness and promptness of ripening of the crop. These characteristics allow the grower to prepare the land and sow the seed before the other spring work presses, to get a cash return early in the season, and then devote the land to another crop.

For garden and for market, the small pods and comparatively poor flavor of the peas are handicaps; though great quantities of Alaska type peas are grown for these purposes.

Winner. Ref. Letter from Austin L. Rogers, of Rogers Seed Co., Dec. 30, 1926. This canners' pea, usually referred to as Rogers' Winner, originated from a few plants found in 1902 in a field of Alaska peas at Alpena, Mich. By selection for increased size and vigor of plants, an Alaska-type pea was developed with shorter pods and much smaller peas, which well met the demand, so widespread for a time, for a canners' pea that would grade high in No. 1s.

In our small canning crop tests in two seasons, Winner on 5 plats averaged at the rate of 2,983 lbs. of usable peas per acre, of which much larger percentages were of No. 1 and No. 2 grades than in the 2,648 lbs. of Alaska, the average yield based on 8 plats of that variety. Winner peas are pitted and indented, sometimes almost wrinkled, but their quality is no better than that of Alaska, and the small size of the peas when fully developed tempts to a use of them in canning which injures the quality of No. 1 and No. 2 canned peas of this type.

Rice No. 330. Refs. 64; and letters, Rice, Dec. 4, 1924, and June 1, 1926. Rice No. 330 came, originally, from plants found in a field of peas sold as Canada Yellow Field but really a French canning pea for some years grown in eastern Michigan, much earlier than the ordinary Canadas, with seeds more even in size, much smaller, and of better quality. Among these plants, grown in the test plat as Row 330, Mr. Wilber Brotherton found, about 1905, a single plant, with Alaska-like characteristics, from which, after much selection to get rid of cream seeds, etc., the present Rice No. 330 was developed. From the character-

istics and behavior of the progeny of the plant it was evidently the result of a field cross between the field peas and a blue-seeded variety, possibly Alaska.

Rice No. 330, tho very similar to Alaska, is considered superior to it in disease resistance, and percentage of small peas when ready for canning. In our canning pea tests it was decidedly later than Alaska, outyielded it by one-tenth, and gave decidedly better percentages of the two smaller sizes of peas.

Hustler, improperly listed as "Hustlers" in Bulletin No. 532 of this Station, is distinct from "The Hustlers" (p. 90). It is one of the peas developed, for canning, at the Ashland branch of the Wisconsin Agricultural Experiment Station. According to a letter from Prof. E. J. Delwiche of that Station, Hustler was selected from a cross between Nott Excelsior and Horsford Market Garden, the selection being followed up for the pitted, smooth-seeded type and early maturing habit. "The seed closely resembles Alaska in size, color and shape. In season it is just as early as the earliest strains of that variety. Hustler, as canning tests have shown, is higher in quality than other peas of the Alaska group."

In our canning crop tests, the Wisconsin Hustler did not grade quite as well as the average for Alaska; but gave a slightly larger gross yield.

Horal. Ref. 70. The Horal pea was developed at the Ashland branch of the Wisconsin Station from crosses between Horsford Market Garden and Alaska made in 1901, single plant selections being made for five years until the Horal type was established. This work was in charge of Prof. E. J. Delwiche.

Horal differs from Alaska in almost all characters; but is a canners' pea only, and as it corresponds closer to Alaska in canning quality than to the other parent, it is placed here.

It is two weeks later than Alaska, only three-fourths as tall, stocky stemmed, with very dark green foliage having small leaflets in 6s, with longer, paired pods borne at the top of the plants, beginning at about the 14th of the very short joints. The pods contain more and much smaller peas than those of Alaska, second in size to Rogers Winner, and smaller than those of some strains of that variety. It grades as well or better than Winner and in our tests was decidedly more productive. Were the quality what the green color of the peas and the decidedly wrinkled surface of the seeds would indicate, Horal would be a surpassing variety; but the quality from the can is little, if any, better than that of Alaska.

Resistance to root-rot to a remarkable degree is said to characterize Horal; and it has been found here to be quite resistant to one of the leaf-spot fungi, and fairly resistant to the other.

Market Surprise. Ref. 75; *Jour. Roy. Hort. Soc.* 39:689. 1913. Market Surprise hardly belongs in the Alaska group, since the seeds are mingled cream and green as to the outer coat, with orange and green under color, respectively. The pods are also very slightly curved and pointed at the end, not blunt or

square; but in other characteristics it is so close to Alaska that it seems best placed here.

It was introduced about 1910 or 1911 by Hurst and came to America very soon thereafter. The plants, as described in the above and other references and as grown here for three seasons, are slightly taller than those of Alaska, often branched from the base, bear

pods of fine green color, sometimes in pairs, which are slightly longer than the average for Alaska, largely due to the pointed tip, but are not ready for picking quite as soon. The peas and seeds are but little larger than those of Alaska, and the seeds are usually smooth, but occasionally somewhat dimpled.

SCIMITAR GROUP

This group of smooth-seeded peas includes both cream and green types, and some varieties in which the seeds are mixed in color; tho this mixed color is far less frequent in smooth seeded types than in dimpled and wrinkled groups.

The distinguishing characteristic of the group is the long, slender, curving pods, shown by the well-known Petit Pois or French Canner peas, and represented in the wrinkled peas by varieties like Senator, Lincoln, and Rice No. 13.

The type is an old one, in England dating back to Sickle, listed in the Fuller, Tracy, Blackwell catalog of 1688. Peas of this type are much more popular in France and elsewhere on the continent than in England and America; and it is probable that the history could be traced much further back if the pea literature of continental Europe were studied.

Several varieties of this type have been grown at the Station from French and German seed; but as there is no likelihood that such varieties will ever become popular here, these are not described. A few varieties included in the group do not, strictly, belong in it, the pods being too little curved; but these are not numerous enough to warrant separate grouping. Other varieties, also, are of this type and were once considered garden peas; but are of such poor quality or so viny that they are now grown, if at all, under field culture.

MAJOR VARIETIES IN SCIMITAR GROUP

CREAM SEEDED SECTION

White Sickle. Refs. 1, 2. White Sickle is probably the same as Sickle, listed a century and a half before it, but we lack any description of the old variety. White Sickle was said to be 3 to 4 feet tall, prolific, late, with pods rather shorter and more bent than those of Scimitar, rather larger and similar in color to those of White Prussian. No record was found of this pea in America.

Auvergne. Refs. 7-20. This old French pea was sent to England in 1833 or 1834 by M. de Vilmorin of Paris, and may have originated with him a year or two previously, as it was fully described in 1832, presumably as new, in a French gardening annual. Unlike most smooth-seeded peas, it found favor in England and spread widely, under various names, as the peas, especially when picked early, are small, delicate and of very good flavor. As thus picked, or as sifted from this and similar varieties to remove the larger, harder peas, canned peas of this type, "Petit Pois," "French Canners," "French Sifted" or "Delicatesse," command

fancy prices both in France and in America. Peas of this kind first came to America under the name Scimitar, variously spelled, but have been better known by other names.

They were grown at this Station in 1884 under the old name, Auvergne, and in our recent tests both as Scimitar and as Petit Pois. The Scimitar seeds, however, from British Columbia, did not give a satisfactory test, little information being secured except the time of maturing, midseason. Good data were secured later, however, from Giant White Scimitar grown from seed sent from McMillan, Mich. The plants grown in 1884, those of Petit Pois, and those of Giant White Scimitar differed very little, nor was the season changed; but there has been a decided improvement in the type in the direction of better pods, those of Petit Pois being longer than those of Auvergne and of Giant White Scimitar than of Petit Pois.

Height 3 to 3½ feet; stems stout, rarely branched; foliage abundant, medium green, not whitened and with little bloom, consisting of 4 or 5, occasionally 6, large leaflets, and slightly to much larger stipules, with large, sharp teeth half way to the tip; flowers large, begin about the 13th node, and except in the Petit Pois, not paired; longest in Petit Pois; pod stalks longer than flower stalks. Pods medium green in color, from 2 to 3½ inches long with Auvergne, 3 to 3½ with Petit Pois and 3½ to 4¼ inches with Giant Scimitar, medium to narrow, slender, plump, much curved, pointed or rounded at the ends, with small tips, and filled to the edges but not to the ends with from 5 to 8 round, smooth, medium green peas; seeds of medium size, very smooth. All varieties were ready in midseason or slightly past it; none gave better than good crops.

It is probably that Giant White Scimitar is Vil-morin's Long-podded Improved Scimitar. Serpette Ameliore, as grown at the Station from French seed, not Vilmorin's, was smaller-podded, with better filled pods and more prolific than Giant White Scimitar.

Early Somerset (Ref. 35) was introduced before 1919 by Kelway and seed of it came to us from the Idaho Station in 1922.

It was dwarf, 1½-1¾ feet (much taller in England), unbranched, with medium to abundant, medium to dark yellowish green foliage, with small, broad leaflets and very much larger stipules, little whitened. The pods were borne singly (paired under best conditions) from about the 7th node, and were straight or slightly curved, blunt-pointed, rarely 3 inches long, but very plump, very pale green in color, and well filled with 4-5 (6-8 in England) moderately large, fairly well-colored peas. The pods soon lost color. It was among the earliest of the curved-podded, smooth seeded peas, and yielded fairly well.

GREEN SEEDED SECTION

Blue Scimitar. Refs. 3-6; Hovey Cat. 1859. Blue Scimitar was first described, with White Sickle,

in 1834. A later reference says it doubtless originated from Blue Prussian and returns to it on poor soil. It evidently became much more widely spread than its companion, and reached America in 1859, where it was considered "very fine and productive."

English descriptions make it $2\frac{1}{2}$ to 3 feet tall; stem simple or occasionally branched; foliage dark green, whitened, pods 12 to 18, usually in pairs, dark green in color, much curved from base to tip, flattened; peas 9-10, of better quality than those of Blue Prussian; seeds irregularly oval and light or dark blue in color. It was later than White Sickle and matured over a long season, making it a favorite of market gardeners.

Laxton Supreme. Refs. 25, 26; Hovey *Cat.* 1869; *Roy. Hort. Soc. Jour.* 12:35. 1890. Supreme was one of Laxton's first seedling peas, and for many years after 1867 was said to be the result of a cross between Prolific Long-pod and Little Gem; but in 1890 Laxton gave the parentage as Advancer by Prizetaker, a more probable origin when the plant characters are considered. The variety was introduced in 1868 by Carter and reached both France and America in the following year, and Germany very soon. It was grown at the Station in 1884 under its own name, and in 1885, from seeds sent from France under the name Green Auvergne, the identity of the two escaping notice, but the descriptions (partly from manuscript notes) vary in no essential details

This Supreme and one later put out by Sutton, grown here in recent tests, are quite unlike.

Laxton Supreme was very much like the old Auvergne but with taller, stronger stems, shorter jointed and more branched, and with larger, more whitened leaflets and stipules; pods began slightly lower on the stem, about the 11th or 12th node, were more often paired, rather shorter and less curved, broader and decidedly more plump, often being thicker than wide, and saddle-backed. They were beautiful pods, very well filled with 6-8 roundish, often compressed peas. The seeds were indented or slightly wrinkled, rather dull green, tinted cream or bluish white. The crops were quite good, but late, maturing gradually.

Carter Hundredfold. Refs. 28; *Jour. Hort.* 43:83. 1870; Bliss *Cat.* 1873; Hogg *Gard. Yr. Book* 14:145. 1873. This pea, entirely distinct from Sutton Hundredfold, was first noticed in 1869, and was advertised the next year by Carter. Some early references credit it to Thos. Laxton, and call it

a cross between Laxton Prolific Long-pod and Ne Plus Ultra; others say it was in a collection of seedling peas grown by Carter from crosses of Laxton's peas, and ascribe to it the same parentage; but Laxton himself said it was not originated by him, nor did he believe the parentage given correct, as his Prolific Long-pod had not, in 1869, been introduced long enough for it to be the parent of a variety with any considerable amount of seed stock. It was mentioned in an American periodical in 1870 and listed by Bliss in 1873, but apparently little grown here. It did not disappear from English lists until after 1900, but was never widely grown. It was included in recent U. S. Department of Agriculture tests.

It was a tall, late variety, prolific, with long, curved, deep green pods, having long-rounded ends; notable for the fine color of the peas which was retained after cooking. For this reason it received its synonym "Cook's Favorite." It was often compared with Carter Supreme; but its seeds were smooth and olive green in color, those of Supreme, wrinkled and mixed cream and green; and its pods rather wider and more curved.

Hogg says this is the same as Prizetaker, and his figure of the pod of Prizetaker corresponds to the above description. Prizetaker is discussed in the Dimpled-seeded group.

SABRE SECTION

Sabre. Refs. 37; *Gard. Mo.* 19:242. 1877. Two Sabre peas were grown at the Station, White in 1884 and Green in 1886, both from German seed, but neither variety has found favor either in the United States or England, tho said in 1877 to be most highly esteemed for earliness and productivity of all peas grown by market gardeners near Paris. In 1920 it was by no means so popular there. Sabre was also grown here in 1926 from seed produced at McMillan, Mich. It has apparently not changed in 40 years.

Height from $2\frac{1}{2}$ to 4 feet, according to season; stems rather stout, rarely branched; foliage medium green, slightly whitened; pods from about the 13th node, rarely paired, light green in color, moderately broad, very plump, and strongly curved forward from base to the rounded end; peas 5 to 9, averaging 7 in the last test, roundish or long oval, often compressed; dry seeds of medium size, and cream or green in color according to the strain. It was fairly productive, with pods ready in midseason.

DIMPLED-SEEDED GROUP

The varieties of peas included in our Dimpled-seeded group are united by only one characteristic, a similarity in seed surface and shape; and often differ considerably even in that one. In other respects they make a decidedly heterogeneous collection, including sub-groups quite dissimilar in plant, foliage and pod characters. The pods are usually large, making many varieties in the group very attractive market-gardeners' peas; and the quality is generally much better than that of the smooth peas. Indeed some of the recent additions to the group compare quite favorably with wrinkled peas; and the hardness of the seeds permits early sowing and gives comparatively early crops altho the actual time required for growth ranks most of the varieties as second early or later. In markets where the supply

is largely local, these "dimpled" peas fill a distinct and useful place. Too often, however, they are sold for Gradus, Telephone or peas of even better quality.

Distinguishing characteristics.—The basis upon which the group rests is, primarily, the surface appearance of the ripe, dry peas; and, secondarily, the general shape of these seeds.

No variety has been placed in the group if the seeds are nearly round and the seed coat smooth or merely marked with small deep pits like those on a thimble, such as characterize many of the better Alaska types; nor, on the other hand, if, though oval or angular in shape, they are nearly covered by a network of fine folds and ridges. The depressions of the surface which characterize dimpled peas are quite shallow and wide,

distinctly separated by areas of smooth surface, these surface depressions usually covering somewhat similar indentations of the cotyledons — dimples rather than pits.

On the other hand, if the seeds are compressed from the round shape into one more or less square, oblong, oval, or cylindrical, even if the surface is hardly more than pitted, it has been thought best to include the variety in this group, altho it probably represents only a transition stage between the true round-seeded peas and the varieties more characteristic of the "dimpled" group. Many of the older varieties included here, those originating before or in the second quarter of the last century, have seeds approaching the roundness and smoothness of the Alaska, Tom Thumb, White Marrowfat and Extra Early types; and should, probably, be considered as forming a sub-group; as the large, rather irregular-shaped seeds are pitted and slightly wrinkled, rather than dimpled; but the seeds pass so gradually from the type of the sub-group to that of the true dimpled peas that it would be impossible to fix limits for a sub-group. At the other extreme in the group are many varieties, often classed by some authorities as wrinkled peas, in which the dimpling is subordinated to an apparent wrinkling of the seed coat. These "dimpled-wrinkled" peas, however, usually carry, also, the thick, tough skins of the larger round peas, like the American Marrowfats, and of the oval, oblong or angular characteristically dimpled seeds. Such peas, though they would be called wrinkled on casual inspection, differ so markedly, in skin texture and in coarseness of wrinkling, from the seeds of the "Sweet-wrinkled" types with thin, tender skins and more delicate, finer creasing and ridging of the seed coat, that they must be placed in this group rather than in any of the wrinkled pea groups.

It should be remembered, also, that the basal characters of peas in the semi-smooth-seeded group vary widely under different conditions. Not only does the same variety behave differently in different localities on different soils and in different seasons, but the crop seed may differ markedly from the seed sown. In one season of much and well-distributed rainfall during our Station pea trials, nearly all of the typically dimpled-seeded peas sown gave crop seeds that approached very closely to wrinkled peas, with a marked increase in green pigment. Pure cream seeds sown gave crops of quite evenly divided cream and green seeds; and the heterozygous, cream and green-seeded varieties gave crops of all green seeds.

It is very fortunate that Mendel's pea experiments were confined to restricted areas, and probably quite uniform seasonal conditions; for if he had been faced by such changes as were shown by parent and uncrossed progeny in the season of 1922 at this Station, he might have had good reason to doubt the fundamental quality of some of his pea characters. It should also be said that, in this particular season, similar changes in surface and color of the seed coats were shown in many other peas than those in this group. In practically all cases increased roughness of seed coats and more or

darker green pigmentation were found in the harvested seeds than in those sown.

The group, because of these diversities, allows no summation of characteristics such as was possible with the Extra Earlies, Tom Thumbs and Alaskas; nor can any strict chronological or genetical history of it be given. It does not trace back, except in very small part, to ancestors mentioned by early writers on the pea; but is made up of smaller groups of different and usually quite recent origin, the earliest of the most typical varieties dating about the middle of the last century. The sub-groups, not adaptable to strict limitation, appear to have originated in quite diverse, even opposed methods. Some arise from the development of smooth peas into larger-seeded types in which crowding in the pod induced denting of the peas; others from reversion to a smoother seed coat of some of the larger peas resulting from Knight's segregation of wrinkled-seeded types, or from similar behavior of later wrinkled peas under varying conditions or through crossing; still others from accentuation of the tendency to dimpling found in some of the American Marrowfats; and probably, in a few cases, from true sporting in other types.

The group permits of division into a cream-seeded section and one in which the seeds are mixed cream and green, olive-green, bluish green, or light to medium green. In very few cases do the ripe seeds show as dark green as characterizes some other sections of peas. The division between the two sections is not a definite or positive one; for as explained previously, these dimpled-seeded varieties are more subject than any other type to variations in roughness of seed coat and depth of pigmentation.

MAJOR VARIETIES OF DIMPLED-SEEDED GROUP

WHITE- OR CREAM-SEEDED

Dickson Favorite. Refs. 32; Burr *Fld. Gard. Veg.* 531. 1863; U. S. Pat. Off. *Rpt. (Agr.)* 1865. Dickson Favorite, introduced in 1854 by Dickson (1), was then considered a form of Auvergne, but the deep pitting, indenting and occasional dimpling of the peas would seem to place the variety in this group, notwithstanding the small size of the seeds, especially as the pods, as now grown, show little curving and are too broad for the Scimitar type.

As grown here it was $1\frac{1}{2}$ to $1\frac{3}{4}$ feet tall, slender-stemmed, unbranched, with light green foliage, considerably whitened, and with sharp-tipped stipules; the single and paired pods were borne from the 7th node up, were 2 to $2\frac{1}{4}$ inches long, plump, square-ended with distinct tip and well-filled with 5 to 7 medium-sized, oval, slightly indented, medium green peas. It was an early, mid-season variety, and only a fair bearer.

Harrison Perfection. Refs. 33; *Cot. Gard.* 25:1861; *Country Gent.* 17:143. 1861. This, first of the white-seeded, truly semi-smooth, or dimpled peas, originated with Harrison (1) about 1855; and reached America about 1861. It was a typical member of the group, though less well known than Harrison Glory, of the green-seeded class.

The plants are robust in growth, with a thick, succulent stem 3 to 3½ feet high, carrying dark-green foliage and bearing 16 to 18 pods to the plant. Contrary to first hopes, the variety was a disappointment, as the large, handsome pods fill very slowly and poorly, are deceptive at first and unsatisfactory when ready. The 5 or 6 large peas are of fair quality but not as sweet as those of Harrison Glory, and in neither variety are they as good as true wrinkled peas like Advancer, which they resemble in habit. Harrison Perfection is a second early, more than a week later than the extra earlies of its time.

Glory (Refs. 40, 41) seems to have followed Harrison Perfection very closely in time; and was advertised by Thomas Wild, of Ipswich, as Gilson's Glory. It is not Harrison's Glory, which is green-seeded.

It is a slenderer, shorter-vined type (2¼–3 feet) than Harrison's Perfection, with pods fully as long, 3¼ to 4 inches, narrower and less plump, with rounded to blunt ends and very small tips: peas 5 or 6, of medium size and dark green color; seeds oblong, or almost square, slightly dimpled, grayish cream.

It was, when introduced, later than Harrison Perfection; but as grown here it was not later than mid-season; and gave a very good crop.

Prolific Long-pod. Refs. 50–53; *Roy. Hort. Soc. Jour.* 12:35. 1891. Thomas Laxton, one of England's most famous pea-breeders, secured this pea in 1858 from a Sangster No. 1 x Prizetaker cross, and it was introduced in 1865 by Carter. It reached America about 1868, was quite extensively grown for at least twenty years, but is no longer listed. The name was also applied, incorrectly, to a green-seeded pea, an inferior stock of Prizetaker.

The true variety was tall-vined, 5 to 7 feet, robust, vigorous, with large, pale-green, whitened foliage; pods slightly curved at the tips, large, 3 to 3½ inches long at this Station in 1884, broad and heavy, 12 to 14 to the vine; with often 9 or more peas to the pod, of good quality but not equal to the true wrinkled types.

It seems to have been a splendid second-early pea for market gardeners.

William the First (Refs. 54, 55) originated from a cross between Little Gem and Prizetaker, or between Little Gem and Laxton Prolific, made by Laxton, late in the '60s, and was introduced by Hurst. It received a First Class Certificate from the Royal Horticultural Society in 1872, was listed in America in that year and was grown at the Station in 1884, but probably never widely distributed here.

The vines are of the Extra Early type, tall, slender, unbranched, light green in color, with 4 leaflets, and large, whitened stipules; but the pods, and particularly the peas, place the variety in the "dimpled" group. The pods are borne from the 9th node up, on long, slender but rigid, sometimes leafy, stalks, are 3½ inches long, broad, plump, round-pointed with very small tips, light green in color, quite rough toward maturity, and contain 7 or 8 large, compressed, ovate or almost wedge-shaped pale green peas.¹

In early descriptions the pods are said to be dark bluish green in color, with heavy bloom and seeds light bluish cream or mixed, and indented; but seeds received here from the University of British Columbia were bright cream in color, large, oval, and typically dimpled. They are evidently variant in seed coat characters as are those of so many of the group. The variety matures very early and gives good crops.

Several improved strains of William the First have been introduced at various times, one dating about 1887 being called William the Conqueror (Ref. 56).

Sunrise. Refs. 73–75; *N. Y. Sta. Rpt.* 3:254. 1885. The Messrs. Day, of England, originated this pea before 1880, during which year and the following one it was distributed by several English seedsmen, and by at least one in America. It was tried out at this Station in 1884, and again within the past five years from seed sent by the Idaho Station and the University of British Columbia, from the latter under the name Early Sunrise. The two strains differed slightly, *not* in season, but mainly in greater vigor, more luxuriant foliage, slightly larger pods and distinctly larger peas in the one from British Columbia; tendencies that marked practically all varieties received from that region where peas grow about as well, and as large, as in England.

This British Columbia strain differed very little from the variety as grown here by Goff. It gave vigorous plants from 2 to 3 feet tall, sometimes branched at the base; with stems stout, internodes short; foliage abundant, deep green, scarcely whitened and with little bloom, flowers about the 11th node; pods usually single (paired in early test), 2½ to 3¼ inches long, rather broad, straight, with rounded to blunt ends and small tips, poorly filled; peas 4 to 6, medium to large, oblong or oval, light green; seeds oblong, indented, cream-colored, weighing about 75 or 80 to the ounce. Only fair crops were secured, but these were ready somewhat earlier than in the older trials, when the variety was recorded as rather late and maturing its crop rather gradually. It is probable that growth in a warmer, drier season than that of British Columbia accounted for the earlier maturity.

References to the use of this pea in the South by market gardeners are favorable.

Pilot. Refs. 106–110, 152; *Burpee Cat.* 1910. Altho there are some discrepancies in references, Pilot apparently originated with Dickson (2) previous to 1903 when the pea was given an Award of Merit by the Royal Horticultural Society Hurst & Co., and Watkins & Simpson, are also credited with the introduction of peas bearing this name, or similar ones, like Primo Pilot, Primo, and Premo, which, however, are probably strains or improvements of the original "Hawlmarm" Pilot. In one place Pilot is said to be a selection from Gradus and in another the result of a cross between this pea and Early William. It was brought to America in 1910, and is now quite generally listed. Pilot seed was secured from two firms and that of Primo Pilot, Improved Pilot, and Premo, each from one source, and all grown here for two or more seasons during the past five years. Slight, but not constant nor consistent, differences were shown between the different strains; but these were not greater nor greatly different from the variations in descriptions of Pilot grown at different times or different places in England. Primo Pilot, all things considered, seems a rather superior strain.

Height varying, 2 to 3 feet; stems slender to moderately stout; internodes rather long, nearly always branched at the base

¹ This description was made at McMillan, Mich., in the test plots of the United States Department of Agriculture, as the descriptions made from the Station plants were incomplete.

and always above: medium green foliage, moderately abundant, slightly whitened and without much bloom, consisting of non-characteristic leaflets in fours and stipules only slightly larger, with blunt to rounded tips, sharply toothed below and shallowly above: flowers from the 7th or 8th node, usually single on moderately long, slender stalks: pods from $2\frac{1}{2}$ to nearly 4 inches in length, broad, quite plump, straight, with pointed, or long-rounded, tipless ends, medium green, usually not very well filled: peas usually 4 to 6, large, round, indented, or oval, medium green: seeds typically dimpled, oblong or oval in shape, bright cream in color, with some green, the amount of green and the degree of wrinkling varying decidedly according to strain and season. Seeds of the later introduced and improved strains showed more of the green pigmentation.

The Station crops were not large, but were ready for picking in 60 days or less from rather late plantings. The comparative earliness and large size of the pods making Pilot a very good pea for market.

Hartner's Early Market and Hartner's Miracle are apparently local names for Pilot or Pilot strains.

Eight Weeks. Refs. 111, 112. Carter introduced this pea about 1903, claiming for it the good points of its parents, American Wonder and William the First.

It is the dwarfest of the group, growing only about 1 foot high on the Station grounds, but producing a very good crop of pods similar to those of Pilot but averaging slightly shorter, not quite as broad, occasionally slightly curved, and of better color. The pointed ends, due to undeveloped peas, detract somewhat from the attractiveness of the pods. Plants small, stocky, with few basal branches; the 4 to 6 large peas of good color and fair quality; and the ripe seeds are slightly smaller than those of Pilot, 105 to 120 to the ounce, and less dimpled, otherwise similar. Some pods were ready for picking in from 50 to 60 days, the time varying with time of planting and season. Eight Weeks, Early Eight Weeks and Extra Early Eight Weeks were names under which different lots of seed were received: all were alike in season, and bear heavily, so that good crops can be secured from comparatively small areas.

Kelway Beauty. Refs. 138; Randall-McLaughlin *Cat.* 1920. Kelway Beauty appears as a "novelty" in the 1919 catalog of the firm, but as it was listed in America in 1920, it probably originated considerably earlier.

As tested at the Station for three seasons, it is of dwarf type, 2 feet; stems moderately stout, semi-erect, unbranched; foliage moderate in amount, dark green but whitened, consisting of small, rather long leaflets in 6s and slightly larger, round-tipped stipules; flowers often paired, begin at the 6th or 7th node; pods typical of the group, usually single, on long, thick stalks, nearly 4 inches long, broad, pointed at the end, decidedly light in color and poorly filled; peas averaging only 4 to the pod, large, long oval or oblong and deep green in color; seeds medium-sized, cream-colored, varying as do others of the group. The pods are ready in midseason, and the crops have been only fair.

Isbell Beauty, introduced by S. M. Isbell Co., Jackson, Mich., is an early selection from Kelway Beauty but is classed as a Wrinkled cream-seeded pea.

Radio (Refs. 137, 138) was new to America in 1924. Tho listed by Maule as his, no definite statement was made as to originator, date of origin, or parentage; but a letter from this firm, Apr. 15, 1926, says it came from England and was named and introduced by Maule. Charlton's Radio, as seeds were labeled when received from the test plats of the U. S. Department of Agriculture

at McMillan, Mich., was grown here in 1926, and tho considerably taller, appears identical in other respects with Radio from Maule and another American firm. Charlton lists Radio, apparently not new, in the catalog of 1924. All three differ slightly in color and roughness of seed coat.

GREEN SEEDED SECTION

It is now impossible to separate satisfactorily, either from each other or from several varieties of wrinkled peas, some ten or more varieties of this section of the dimpled-seeded group which originated before, or shortly after, the middle of the last century. Interlocking synonyms, incorrect assignment of synonyms, duplication of names and synonyms, variations in stated dates of origin, and scanty or imperfect descriptions form an impenetrable maze. Fortunately, few of these varieties are important in American pea history, but some discussion of them is necessary as a foundation for the group. These are generally relegated to the subsection of minor varieties.

Groom Superb. Refs. 8-12; Sinclair *Cat.* 1839; Burr *Fld. Gard. Veg.* 526. 1863. This pea was described in 1834 as only $1\frac{1}{2}$ to 2 feet tall, with $2\frac{1}{2}$ -inch, compact, blunt-ended pods and large peas, the seeds being white and light green. It was even later than Early Green Marrow. Later it was said to have originated with Groom, who sent out seeds of it in 1831. It was considered a distinct dwarf variety of Blue Prussian, with very large and probably indented peas. It was very productive and the peas thought of excellent quality when first introduced, but by 1861 "much surpassed by others."

It was listed in America in 1839, and described by Burr in 1863, who found it decreasing in popularity tho still grown because of its dwarfness and profuseness.

Burbidge Eclipse. Refs. 24; *Jour. Hort.* 48:401. 1872. This pea was long grown near Canterbury, Eng., where it was known as Stubbs' Dwarf, from the grower, but nearly 30 years later, about 1849, was introduced to commerce by a nurseryman at Buckland, near Dover, who gave it his name, Burbidge, combined with that of a famous racehorse. It was introduced into America almost at once, and continued to be listed here until 1889, at least. Probably Stubbs' Blue Marrow is the same as Stubbs' Dwarf and Burbidge Eclipse.

It was very dwarf, under 2 feet, unbranched, with dark green but blotched foliage, matured quite early, was prolific and bore long, broad, plump, paired pods containing 5-6 large peas of good quality. The seeds were bluish olive green and slightly indented.

Prizetaker. Refs. 27-31; Hogg *Gard. Yr. Bk.* 14:83. 1873. Prizetaker, perhaps better known as Beck Prizetaker, and Prizetaker Green Marrow, was one of the most widely grown and most popular peas in England, being pronounced best of 60 varieties grown on Sutton's trial grounds in 1860; was well known in America and was cultivated to some extent in France.

It was said to be a selection from Bellamy Early Green Marrow, made or developed by Beck, whose name

is also connected with Beck Gem, progenitor of Tom Thumb. It was probably first advertised in 1854, tho grown prior to 1850, and was tested by the Royal Horticultural Society in 1859-60, again in 1867 and again in 1901. It came to America shortly after 1860 and was tested at this Station in 1884, and in Maine in 1888, but does not seem to have been included in Bailey's list of 1889.

As grown here by Prof. Goff, it was a very prolific midseason variety of medium height, 3 to 5 feet; stem rather slender; foliage abundant, dark green washed with white and slightly glaucous; leaflets and stipules rather large; only moderately plump, slightly curved, rounded or blunt at the end when well filled; peas 5-8 (sometimes as many as 11), large, compressed, pale green; seeds dull yellowish green or cream, roundish, indented, or irregular in shape.

Harrison Glory. Ref. 33. This, perhaps first of the true dimpled peas with green seeds, originated with Harrison (1) before 1855 when it was advertised by Sutton. Except for the color of its seeds it was considered identical with Harrison Perfection. As the latter was not grown at the Station this similarity cannot be confirmed; so it is thought best to give a somewhat detailed description of this green-seeded variety. It came to America about 1861, was listed by Bailey in 1889 and was still grown in Canada as a field pea in 1901. It was grown here for three seasons, first from seed sent us by the Idaho Station and later from harvested seed.

It was comparatively short-vined, 2 to 2½ feet, erect, to drooping, hardly needing support; stem quite stout, with very short internodes and no branches; foliage abundant to dense, dark green, decidedly whitened and quite glaucous; leaflets varying from 4 to 6, of medium size and rather long; stipules much larger than the leaflets, clasping the stem deeply, with rounded tips and teeth about one-third of the way up the margin; tendrils quite conspicuous, stocky, much curled; flowers begin at the 14th node, generally paired, on moderately long, stocky stalks; pods from 2½ to 3½ inches long, quite broad, moderately to very plump, oval in cross section, slightly curved, usually filled to the edge, but not to the end, which is rounded to blunt, or even square when specially well filled, of good color, only slightly lighter than the foliage; peas 4, 5 or, rarely, more, large, oblong, flattened, medium-green; seeds medium or above in size, about 100 to the ounce, square or flattened in shape, semi-smooth with a few large shallow pits or dimples, cream and bluish cream in color, becoming much better green, more dimpled and larger under changed seasonal or soil conditions. As the cotyledon color is generally green, even under a cream skin, the variety is properly placed in this section. The pods were ready for use in about 10 weeks after late sowing, requiring a week to 10 days longer after early sowing. The crops were fair to good.

Leader. Refs. 57; *Ann. Hort.* 194. 1891; Allan *Cat.* 1914. There are evidently two Leader peas, the first originating about 1868, said to be one of Laxton's new crosses, from Veitch Perfection and Little Gem, and much like the former, tho probably earlier. This cross should give a wrinkled pea, but available descriptions leave this point in doubt. A broken series of references, many of them American, seems to connect this pea with Johnson's Leader, called a "round-seeded Gradus" and said to be a selection of the round seeds of that variety; but we were unable to find time or place of its origin. Several strains of Leader were grown here recently, all much alike and all agreeing in

general characteristics with those given for Johnson's Leader, though rather more dwarf than indicated by the varying figures for height found in different references.

Short, stout-vined; foliage dense, medium to dark green, somewhat whitened and only slightly glaucous; flowers from the 9th node up; pods single, on very short, moderately heavy stalks, 3½ to 4 inches long, broad, fairly plump, slightly curved, with pointed or long-rounded, tipless ends, of good green color; peas few, large, oval and flattened, dark green; seeds large, semi-smooth to almost wrinkled, mixed green and cream, with tendency to increased green and more wrinkling in favorable pea seasons. It is a second-early in season and gave good to very good crops. It is apparently a better pea than Pilot. The dimpled-seeded Leader grown at Wisley in 1925 was 5 feet tall, but otherwise like the descriptions above. (*Roy. Hort. Soc. Jour.* 52:109. 1927.)

Blue Peter. Refs. 58, 59. Carter introduced Blue Peter before 1872, when it was given a First Class Certificate by the Royal Horticultural Society. It was called a larger, better and earlier Tom Thumb with "blue" seeds. As received here, from France, the seeds are dull green, with some cream, more or less angular or square and only slightly dented or dimpled.

The variety came to America within ten years of its introduction but seed of it could not be located in this country for our recent tests. It was grown at the Station from 1882 to 1884 and fully described in 1884. In a list of the peas grown at the Station (Bul. 69) in 1893 for display at the World's Fair Blue Peter is called McLean's, and said to be one of the best of its class. Prof. Goff's descriptions do not differ in any material way from those secured here later, altho he mentions as characteristic a decrease in size of the leaves toward the top of the stem, a point we did not observe, nor is it spoken of by others. His plants were very slightly taller and pods a little longer and perhaps better filled than those we grew.

Very dwarf, rarely over a foot in height, with some branches both at base and above; foliage abundant to dense, very dark green glaucous, but not whitened; leaflets and stipules small; tendrils conspicuous, slender, moderately curled; flowers begin at the 6th node; pods in pairs on short, heavy stalks, 2½ to 2¾ inches long, rather narrow, but moderately plump, straight, rounded at the end with small tip, not quite as dark in color as the foliage; peas 5-7 rather large, indented, oval to almost cylindrical, medium to dark green; seeds medium in size, about 130 to the ounce, smooth, semi-smooth or slightly dimpled, and dull green in color. The crops were very good, and early for dimpled peas.

Fillbasket. Refs. 60-63. Laxton raised this variety before 1872 and it was sent in that year to the Royal Horticultural Society gardens for testing under another name, which, because the plants bore so very freely of large pods, was changed by a Committee of the Society to Fillbasket. It received a First Class Certificate. It is said to be a Standard x Laxton Supreme cross. It soon became popular, was grown in France, and reached America about 1882, being grown in Station tests in 1883 and 1884. "Improved" strains of it have been distributed at various times, in both England and America, one of the latter being Simon's Fillbasket, introduced in 1890 by Moore & Simon. As grown here recently this seemed really an improvement, taller in vine and rather later than the other strain tried. The crops were better and the pods decidedly longer and broader, not quite as

plump, and contained more and larger peas, both pods and peas being somewhat better in color.

The strain grown by the Station in 1884 seems to have been lighter in color of foliage, pods and peas than either of those grown recently, and intermediate in height and pod size between these two strains.

The better strain, Simon's Fillbasket, was 4-4½ feet tall; stem stout, with few medial branches; foliage abundant to dense, dark green, slightly glaucous and whitened, with 4-5 very large leaflets, and large, deeply clasping stipules; flowers at the 12th node; pods paired on long, thick stalks; 3¾ to 4¼ inches long, broad, moderately plump, straight, with long rounded to rounded ends, only moderately well filled, peas 6-8, large, rounded oblong, medium green. Seeds varied in color from cream to dark green, oval to oblong in shape, semi-smooth to slightly wrinkled. Nine weeks or more were needed for marketable pods, but the plants continued to produce for three weeks giving splendid crops,—among the best.

Telegraph. Refs. 64-70. This Telegraph, precursor of the familiar Telephone, is entirely distinct from the older, little-known, smooth-seeded pea of the same name. It originated before 1877¹ with Culverwell, probably from a Veitch Perfection x Laxton Prolific Long-pod cross, and was introduced by Carter. It was decidedly the best of the dimpled peas of its time, with a very strong stem, usually branched, 4-5 feet tall, covered with fine dark green foliage, and producing abundantly long, broad, plump pods, straight or slightly curved, dark green in color and well filled with large, oblong or slightly compressed peas, of better quality than any but those of the true wrinkled type.

It was widely grown in England, and to some extent in France, while it flourished in America from 1882, at first under its own name, but later, and more generally, under Cleveland's synonym, Long Island Mammoth or Marrowfat), under which name it is still usually listed here.

It was grown at the Station from 1882-1884 under its own name, and during our recent tests under the synonym. The old description might almost be substituted for the one lately made tho the latter shows some deterioration in decreasing size of pods and peas.

Improved Telegraph, New Telegraph and Super-Telegraph have been introduced at various times, and have maintained the good qualities of the original Telegraph, if, indeed, they have not improved them in the direction of shortening the vines, lowering the flowering node, lengthening the pods, removing the tipward taper, and making them more uniform, increasing the size of the peas and improving color of both pods and peas. All the strains fail, at the Station, to give the full, many-seeded, plump pods secured in England.

It remains, however, rather more productive than Telephone.

Pride of the Market. Refs. 76; *Jour. Roy. Hort. Soc.* 34:717. 1910; *Burpee Cat.* 1886; *Gard. Chron.* (3rd ser.) 22:276. 1877. This pea is credited by Sutton to Culverwell, while a French reference

says it is Laxton's; but it is generally given as Carter's Pride of the Market since that firm introduced it about 1881, when it was given a First Class Certificate by the Royal Horticultural Society. It came to America very promptly, 1883, and is still listed here, tho the seed we received from a prominent firm, on plants from which we based our description sheets, proves not to have been true to name. The description here given is, therefore, that secured in 1925 on a visit to the test plats of the U. S. Department of Agriculture at McMillan, Mich. This corresponds very closely to Prof. Goff's description made in 1884.

A very vigorous dwarf pea, 1½ to 1¾ feet tall; stem stout, upright, not needing support, often with both basal and medial branches; foliage abundant, light green, consisting of large, rather broad leaflets in 4s and slightly larger, whitened stipules with very shallow teeth on the lower half of the margin; pods usually single, on short heavy stalks, almost straight, 4 to 4¼ inches long with rather long necks, broad, tapering gradually to rounded or blunt ends with very short straight tips, dark green in color with much bloom; frequently with a slight curve in the dorsum toward the tip giving a peculiar sharpened or "beaked" appearance; peas 5 or 6 (4-8, Goff), pale green, ovate, compressed; seeds large (72 to ounce), dull green or variously tinted to creamy white, and dimpled or somewhat wrinkled.

It is moderately prolific, ready in midseason, and ripening rather gradually.

Another Pride of the Market recently tested at Wisley, England, originated in Australia; and is later and poorer in color of both pods and peas than the one here described.

Early Bird. Refs. 76; *Gard. Chron.* (n. ser.) 28:618. 1887; *Bolgiano, J. Cat.* 1918. Early Bird is referred to as "from Mr. Berberry" but he is not given as originator, and Knight's (not Thos. Andrew Knight, breeder of wrinkled peas) Early Bird, grown here from seed produced on the United States Department of Agriculture plats at McMillan, Mich., proved to be identical with our true Early Bird. The variety is said to be a Kenilworth x Advancer cross, and to be of as good quality as the latter pea or Telephone, but not as good as Ne Plus Ultra. The first reference we have to it was in 1884; but it seems to have been long in reaching America, apparently not listed before 1917. By some seedsmen Early Bird and Acquisition are held synonymous.

As with Pride of the Market, seed untrue to name was received here for testing but this was discovered in time for a test of the true variety to be made in 1926. This supports the English characterizations of it as a dwarf, improved William the First.

Height, 1 to 1¼ feet; much branched; pods rather variable, some more than 4 inches long and others just above 3 inches, broad, moderately plump, slightly curved toward the tip, filled to the edge but not to the exceedingly long rounded end; peas 4 to 7 (of which one or more at tip and at base were often abortive making the average of good peas about 5), large, round, oval, somewhat flattened, and only medium green in color, as are the pods. Pods could be harvested in early midseason and the crop was only fair.

¹ The name Telegraph is sometimes given as 1868, but unless it was very slowly developed this is probably incorrect, as Carter's advertisement of it in 1878 calls it "new and distinct" and prices packets of it as 3s 6d (80¢); and Hogg, in 1873, mentions only the old

Evolution. Refs. 79, 80; *N. Y. Sta. Rpt.* 7:136. 1889. Evolution originated about 1882 and reached America in 1886. Laxton, who bred it, says: "A remarkably fine but unfixable pea;" but the latter failing has apparently been remedied, since there seems to be little difference between the peas described here in 1888, in 1893 (*Bul.* 69), and recently.

In general, it has a much branched stem of medium height, dense, dark green foliage, is productive tho late, bears large, round oval, deep green peas and grayish green or deep green dimpled or slightly wrinkled peas; but it is especially notable for its fine, $3\frac{1}{2}$ to 4 inch long, broad, plump, distinctly curved pods well filled, rich deep green in color, usually borne in pairs.

The beautiful pods were favorites at the numerous exhibitions of peas in England.

Ameer (Refs. 85-91) originated about 1885 from crosses made by Thomas Laxton, probably between undistributed seedling peas, one an early blue wrinkled type, and the other tracing to Little Gem. He sold the stock to Harrison (2), who introduced the variety. It received a First Class Certificate from the Royal Horticultural Society in 1885 and an Award of Merit in 1901. It was reintroduced by Hurst, about 30 years later. Seed from the earlier introduction reached America about 1898; but most American stocks probably trace to the reintroduced stock either in the original or an improved type. From a general similarity of its pods to those of Alaska, tho they are much larger, Ameer is often known as Large-podded Alaska, which leads to great confusion, as there are true Alaska-type peas bearing this name and that of Long-podded Alaska.

Claudit, introduced considerably later and a distinct pea, was quite similar to Ameer; and both names have become synonyms of both varieties; while Ameer, particularly, has also been confused with Bountiful and Acquisition.

It is almost impossible to be certain, now, that any American stock is that of the true Ameer. Most of those sold appear to be much shorter in vine than those described in English references, the one grown at the Station, from seed raised by a widely known and very careful seedsman, being only 2 feet in height. It is known to grow half taller than this elsewhere. This strain agrees in foliage color, general shape and color of pods, peas and seeds, in productivity and in season, with those grown in England but the pods are somewhat shorter, rarely exceeding 3 inches, and less curved. Seeds and peas are of medium size, only, the seeds being mixed cream and green, oval or square, and only slightly indented. It was ready in midseason and gave a fair crop.

British Lion. Refs. 92, 92a; *Jour. Roy. Hort. Soc.* 41:283. 1915; Hallawell *Cat.* 1924. When first introduced, before 1886, British Lion was said to be much better than Telephone, which was regarded as one of its parents, bearing its pods nearer the ground. The other parent was Omega, the cross being made by Laxton. We have no record of its early arrival in America, but seeds came to us from the Idaho Station in 1922.

Height $3\frac{1}{2}$ feet; stems moderately stout, branched at the base; foliage abundant, medium to light green, leaflets in 4s; flowers at

10th node; pods single on short, rather heavy stalks; from $3\frac{1}{4}$ to $3\frac{1}{2}$ inches, very uniform, moderately broad, plump, straight, with rounded, tipless ends, filled both to tip and edge, medium green in color; peas averaging 6, large, round oval, very dark green. Seeds medium in size, round to oval, slightly indented, shallowly pitted or slightly wrinkled and grayish green or light green in color. Edible peas were ready in early midseason and the crops were fair to good.

The same or another unseparable British Lion again came into attention in England about 1913, and was probably the source of an American reintroduction in 1924 as "a new semi-dwarf early variety having large, dark green pointed pods; a very heavy cropper." Only a partial description was secured here from plants grown from this stock, but no characteristic differences were noted.

Still another pea of this name was highly recommended by the Royal Horticultural Society (*Jour.* 52:109. 1927) in 1926. This is said to have been raised by Cullen; but seems to differ but little from Laxton's British Lion.

The British Lion listed in the U. S. Patent Office Report for 1865 could not have been any of those described above.

Early Prize (Ref. 95) is an American pea, originating before 1889 with a Mr. Read of Vermont, and said to be a Tom Thumb x Advancer cross.

It appears to maintain very well its dwarf character, as it was only $1\frac{1}{4}$ feet high as grown here recently; pods paired; not as long as early descriptions would imply, rarely reaching 3 inches; more abrupt at the ends and contained as many or more peas than in earlier tests. The pods and peas were only fair in color and of medium size; but the green color and marked dimpling of the seeds indicate good quality; and the crops were good.

Bountiful (Refs. 96-100) was introduced by Sutton in 1892 after trial by the Royal Horticultural Society in 1891. It is said to have come from crossing Sangster No. 1 and Telephone, and was like Ameer, but considered superior to it. It was given XXX, the highest rank, by the Society in 1896 and again in 1915; and seems to have been thoroughly fixed in type in England but as brought to America, about 10 years after its introduction, it proved much shorter-vined, tho retaining the pod and pea characters of the original; and as grown here for three seasons it was still more dwarf. The height in England was from $3\frac{1}{2}$ to 5 feet; early American references make it $2\frac{1}{2}$ to 3 feet, and in our tests it was usually under 2 feet.

Vine slender, showing Sangster No. 1 influence; foliage abundant, medium green in color, with 4 small, even-colored leaflets and slightly larger, somewhat whitened stipules; pods generally single; usually from $2\frac{3}{4}$ to 3 inches long, but occasionally here and generally elsewhere, somewhat longer, moderately broad, plump, slightly curved, medium green in color, filled both to the edge and to the pointed and tipless end; peas 7-8, moderately large, round or indented and oblong, medium to dark green. Seeds medium or small in size, round oval, indented, slightly pitted, and occasionally almost wrinkled. Pods were ready with or slightly earlier than those of Ameer, and crop about the same, almost good.

Bountiful Big Pod, spoken of in 1913 as new and of English origin, was probably only Bountiful, tho said to be of marked branching habit, not a Bountiful characteristic.

Claudit (Refs. 90, 102) was introduced in 1900 by J. M. Squier of Canada but a recent letter from C. M. Squier says the original stock came from France. It is very similar to, but not identical with, **Ameer**, better, closer bred and much easier to keep true to type. The pods are plumper, due to thick, meaty shells which promote good keeping in market, more curved at the end; and tho decidedly lighter in color, have a very marked dark green stripe along the dorsal suture which makes them attractive. **Ameer** does not show this stripe noticeably, but has on the dorsum, near the tip, a characteristic depression of the suture which **Claudit** does not show.

Claudit, as grown here, is also decidedly taller in vine than **Ameer**. It is practically the same in season and in productivity, the slightly longer pods and greater number of peas being counterbalanced by the smaller size of the peas. It is very doubtful if the two varieties could be distinguished by the seeds, although those of **Claudit** were slightly smaller as received here; and both are very similar to those of **Bountiful**.

Old Glory (Ref. 105) appears to have been introduced by Breck in 1903; and it is an excellent, early, almost dwarf pea, with somewhat variant, but generally well compressed, dimpled or almost wrinkled, grayish green seeds. As grown here recently:

Height $1\frac{3}{4}$ to 2 feet; stem rather slender; few or no branches; foliage moderately abundant, dark to medium green, slightly whitened; flowers begin at the 11th node, both single and paired, on long, slender stalks; pods about 3 inches or slightly more in length, broad to medium in width and very plump, straight, and pointed to rounded at the end, usually very well filled; peas 5 to 7, large, round, almost globular, medium green, ready for use earlier than most dimpled peas, and so numerous as to give a good to very good crop.

It seems a very worthy variety for this group, but is not widely known.

Essex Star (Ref. 113) is of English origin, said to have been introduced by Cullen, probably about 1904. It has been listed in this country, and seed of it was sent to the Station for testing in 1924. It does not differ noticeably from several other recent English peas of this group; but was one of the best pod producers and fairly early, tho the pods fill slowly and not very well; so that the actual yield of peas is not above the average. The peas are very large and of better quality than many other dimpled peas. The seeds are rather large, pitted, but not wrinkled; and vary much in color.

Acquisition. Refs. 119, 120; *Sutton Cat.* 1914. An **Acquisition** was introduced by Baker in 1909, and said to be a sport found in a field of **Stratagem**; but enough of description is not given to prove this the same or different from the **Acquisition** announced as new by Sutton in 1914 and described as a larger, darker-podded **Bountiful**. They are at least exceedingly similar; but American introductions are evidently of the Sutton stock, so the question of identity must remain unsettled. This is the more true since two lots of seed of **Acquisition**, obtained from the same seedsman in different years, were themselves different and gave quite different plants, pods and crops. It is possible that one of these strains

was really **Early Bird**, as **Acquisition** is by some given as a synonym of that variety.

Characters of the strain which seem to correspond best to English descriptions: Height $2\frac{1}{2}$ feet, with a few basal branches; foliage medium in amount and in greenness, with large, broad leaflets and slightly larger stipules, blunt to rounded at the tip; flowers at the 11th node; pods single on long stalks, very long, 4 to $4\frac{1}{2}$ inches, occasionally almost 5, broad, fairly plump, straight, with pointed ends, late in filling and rarely perfectly filled; peas 5-6, very large, oblong, whitish green or light green; seeds large (94 to the ounce) semi-smooth to pitted, round oval, bluish or grayish cream.

The other strain had much smaller seeds, was shorter in vine, without branches, with foliage more whitened, small not broad leaflets, and sharp-tipped stipules; flowered at the 8th or 9th node and bore shorter pods, rarely 3 inches long, somewhat broader, with one-third more peas, which were decidedly smaller.

The season of the two strains differed but little, both early midseason; but the small-seeded strain gave distinctly better crops.

Neither strain warranted the praise given **Acquisition** in England, and by some growers in America; but the pods of the large-seeded strain are very attractive; and if well filled and more abundant would make **Acquisition** a fine variety. It is evidently quite sensitive to variations in soil and seasonal conditions.

Superb. Refs. 124, 125. Laxton sent **Superb** to the Royal Horticultural Society tests in 1911, and it was again tested in 1913, 1917, and 1920, receiving the award **Highly Commended** in the latter year. It has been listed by several American seedsmen, first in 1919, and was grown in our tests from two different seed stocks, one from England. The strains differed but little.

Very dwarf, $1\frac{1}{4}$ to $1\frac{1}{2}$ feet, with long pods, $3\frac{1}{4}$ to 4 inches, slightly curved, with pointed or rounded ends. The foliage from the English seed was lighter in color, with larger leaflets and stipules, blossoms higher on the vine, pods lighter colored, with more and smaller peas, and ready about 5 days earlier. The seeds of both were large, oval, or oblong, flattened and mixed cream and green. Both gave good crops, that from the acclimated American seed the better.

Carter's Early Superb is apparently a first early pea, developed from **Superb**, and very similar to it. This is probably not yet known in the United States.

Wonderful (Ref. 141) was introduced in 1921 by Schell; and as grown here seems an improvement on practically all the dimpled peas tested, as the crops were good to very good, pods large, dark green and attractive, and the peas large and remarkably sweet for the type.

Height $1\frac{3}{4}$ feet; stem stout, almost erect, occasionally branched at the base, dense, medium to dark green foliage, of 4-5 exceedingly large leaflets and larger stipules rounded and slightly waved at the tip, distinctly glaucous, and resistant to disease; pods single and paired, begin at the 10th node on long, stout stalks, $4\frac{1}{4}$ - $4\frac{5}{8}$ inches long, broad, moderately plump, straight, with pointed to long rounded ends, not quite perfectly filled; peas averaging 8, large, round oval, indented, with peculiar, almost conical tips; seeds very large, compressed, nearly wrinkled and of a distinct bluish cream to bluish green or light green color. The pods are ready in early midseason.

World Beater (Ref. 148), cataloged by Williams in 1923, seems to vary as much or more in seeds than any other dimpled pea. Those received here in 1924 were hardly more than smooth peas with one-third or one-



Dwarf, dimpled-seed

SUPERB

(Two-thirds natural size)



Curved-podded, cream-seeded type

ALLAN CANNER

(Two-thirds natural size)

half slightly pitted or dimpled, while those bought in 1926 from the same company, tho showing the same general size and color, would be classed without hesitation as wrinkled peas. The pods show slight variations also; and are much more rounded at the ends than those of other dimpled peas, often square. They are quite even in size, from $2\frac{3}{4}$ to $3\frac{1}{8}$ inches long, moderately

broad, almost plump and straight. They soon show a finely netted deep wrinkling, which with their somewhat light green color would apparently make them rather poor market peas. The pods set low, and are single, yet give a fair crop, ready in midseason. The stems are 3 to $3\frac{1}{4}$ feet tall, moderately stout, and often branched both at the base and above.

WRINKLED, CREAM-SEEDED GROUP

As with the Dimpled-seeded Group, the varieties included in our Wrinkled, Cream-seeded Group are united by only one character, expressed in the name of the group. This is a distinctive, and usually quite constant, character; and allows a preliminary separation of varieties by the seeds alone, something not possible with succeeding groups of wrinkled peas. Many of the varieties included might well fall in other groups, and a few are mentioned in such groups, or the other group is referred to under description of the variety included here. There is a considerable variation in the degree of wrinkling of the seeds of different varieties in the group; and some varieties occasionally show some admixture of greenish seeds, this condition being influenced, tho less markedly, by soil or seasonal variations which so noticeably affected the dimpled-seeded peas. Usually the seeds of varieties included are practically all cream-colored. Many of these trace to the "white-seeded" varieties bred by Thos. Andrew Knight; but it is not thought advisable to attempt any very strict historical or chronological arrangement of the varieties, except such as is indicated by the succession of names, synonyms and dates as given in the grouped references. Convenience has led to a series of sub-groups based more or less definitely and more or less accurately on the heights of the plants.

MAJOR VARIETIES OF WRINKLED, CREAM-SEEDED GROUP

VERY DWARF PLANTS

Minimum. Refs. 1, 2; N. Y. Sta. *Rpt.* 3:266. 1885. Except some peas grown in Europe for borders and incidental pod production, Minimum is probably the smallest cultivated pea, frequently being only 6 inches tall, tho bearing a fair load of pods. It is Laxton's, introduced about 1880 by Hurst and brought to the United States in 1882. It was tested at this Station in 1884, and grown in many places in the country for at least a decade; but the small size of the pods and the low yields, except under practically forcing conditions in hand-worked gardens, soon retired it from commerce. The stems were very short-jointed, foliage light green, and the short ($1\frac{1}{2}$ to 2 inch), straight, blunt-ended pods were still paler. The seeds were very small.

Sutton Harbinger (Refs. 4, 5) was introduced in 1898 and received an Award of Merit from the Royal Horticultural Society in 1901, which was confirmed in 1915, but not given in 1921. Our first American record of it is dated 1903; it was still listed as late as 1919; and seed of it was received here from British Columbia in 1922. It is very different from Laxton

Harbinger, an Alaska-type pea probably never grown in America.

We found it a very dwarf, very early, heavy-cropping variety, with distinctly shorter pods than those of Mighty Atom, borne from 5th or 6th node up, blunt to square ended, and with from 3-5 light green peas, considerably smaller but of better quality than those of Mighty Atom.

Reading Wonder. Refs. 7; Burpee *Cat.* 1913. Reading Wonder was introduced in 1908 by Sutton and reached the United States in 1913. It was grown at the Station for several seasons and also in the U. S. Department of Agriculture plats at McMillan, Mich. The plants at McMillan, and those grown here from seeds from that place, were taller and pods distinctly larger than those we grew from British Columbia seed.

It was dwarf to very dwarf, almost as early and yielding about as well as Harbinger, with pods as long or longer than those of Mighty Atom, and pointed or long-rounded like that variety, not quite as well colored, with fewer and larger peas of decidedly better quality.

Clibran Masterpiece (Ref. 8), introduced by Clibran within a very few years, is distinct from Sutton Masterpiece, a comparatively old, green, wrinkled main-crop pea.

Clibran's pea is not yet in commerce in this country; but has been grown in the U. S. Department of Agriculture plats at McMillan, Mich., and at this Station; and for its good qualities and apparent resistance to disease, it deserves further trial.

It is exceedingly dwarf, 1 foot here; stems rather slender; foliage abundant; pods $3\frac{1}{4}$ to $3\frac{3}{4}$ inches: quite broad, moderately plump, straight or slightly curved at the tips, with long-rounded ends, not, with us, very well filled; peas 3 to 5, large, peculiarly wedge-shaped, or almost conical opposite the hilum, of very good quality; seeds very large, long oval and finely wrinkled. Crops very good, early midseason.

DWARF PLANTS

Chelsea Gem. Refs. 14-16; Dreer *Cat.* 1896. Chelsea Gem originated with Jas. Veitch about 1887; and may have reached the United States in 1889 as Chelsea, that name being found in American catalogs as late as 1921 but apparently not used in England. Possibly Chelsea and Chelsea Gem are distinct, but the descriptions agree closely. The latter name seems not to have been used in America until 1896; and neither name was found in recent catalogs.

Seed of it, from Holland, was secured in 1922 thru the Wisconsin Station and crops were grown for three years. It was also grown here in 1890, but only brief data regarding it were secured.

Our late trials prove it still a fine variety, about $1\frac{3}{4}$ feet tall, a week later than earliest wrinkled peas, with very good crops of pods usually more than 3 inches long, medium green in color, decidedly

curved, and with pointed to rounded ends, plump and containing 5 or 6 moderately large, rather oblong, light colored peas, which change to small, square or cylindrical, very finely wrinkled seeds, without green. The peas are not quite equal in quality to the green wrinkled Gems.

Chelsea Rival, offered by Hurst & Son, London, since 1919 at least, is an improvement on Chelsea Gem, with light green seeds. Grown here in 1925 in our tests of canning peas, it proved earlier and better than either strain of Cannors' Gem tested.

Delicia (Ref. 20) was probably introduced into America in 1905 by Marlow, and the synonym, Delicatessen, indicates German origin. It had quite a vogue in the middle west and was cataloged as recently as 1923, but seems now to have disappeared.

The name, and synonym, particularly, tend to confuse this pea with Delicates from Holland, and Delicatessen, a Carter name, both of which are probably Petit Pois, or French Canner, peas of the wrinkled type, and quite distinct from Delicia, since the latter is a dwarf early or second early pea, the others medium to tall midseason varieties, with curved pods and seeds distinctly shaded bluish or green.

As grown here for two seasons, Delicia is about 2 feet tall, with a slender, trailing vine and rather scanty, light green, delicate foliage of 4 small leaflets and only slightly larger stipules. Tho not tall, the slender vines need support as the rather heavy pods soon reach the ground. Pods begin at the 10th node, single, on short, slender stalks, $2\frac{1}{2}$ to $3\frac{1}{4}$ inches long, of medium width, quite plump, distinctly veined or wrinkled before ready for use, straight, well filled to the blunt or square ends which carry distinct tips; slightly darker than the foliage, medium green; peas 5 or 6, moderately large, oval or oblong, often indented, light green; seeds small, often flattened and very much wrinkled indicating good quality if harvested before too far advanced; crop about as early as any, and lasts but a short time, giving a small total yield.

Marvellous. Refs. 21-23; Farquhar Cat. 1914. Marvellous was introduced by Hurst about 1913, came to this country very promptly, and is still listed here.

It was grown in our tests for two seasons, but did not quite fulfill expectations as to prolificacy or earliness. It was not generally double-podded, nor were the pods larger than most of the varieties in this group while decidedly smaller than those of Mighty Atom, Referendum, and, particularly, Allotment Holder. The pods are straight, rounded to blunt at the ends, and well filled, but not especially well colored.

Another Marvellous is announced as new in the 1920 Laxton catalog and said to be very dwarf, to have paired pods twice as large as those of Little Marvel and to be a second early. Still further improvement is claimed for this variety in Marvellous Improved, listed by the same firm in 1925.

Color of the Laxton peas is not known but the varieties are included here because of apparent duplication of names.

Sutton Pioneer. Refs. 24, 25; Burpee Cat. 1911. This Pioneer is in no way like the old Extra Early Pioneer, and differs from Cooper, Eckford, Sharpe, and Webb peas of the same name, none of which has probably been grown commercially in America.

Sutton Pioneer was introduced in 1906, was listed in America in 1911, became quite well known and is still sold. It is generally cream-seeded, but almost all stocks show a few light green seeds; and under certain conditions, as in our tests of 1922, many seeds are green. This type is noticed on p. 62.

Height $1\frac{1}{2}$ to $1\frac{3}{4}$ feet; stems stout, drooping with the heavy pods, with occasional basal branches; foliage dense, dark green, slightly whitened; pods begin at the 8th or 9th node, usually single and carried by short thick stalks which often show a small leaf, are from $3\frac{1}{4}$ to $3\frac{7}{8}$ inches long, broad, moderately plump to plump, slightly curved especially toward the pointed, small-tipped ends, and dark green in color; peas 5 or 6, very large, long oval, and dark green in color. The crops are very good, beginning as late second early or early midseason and holding for two weeks or more. The quality is very good.

We have found Pioneer one of the best peas of this group.

Sutton Hundredfold. Refs. 26; Landreth Cat. 1917. This Hundredfold, announced in 1910 and reaching America in 1917, is entirely distinct from Carter Hundredfold (see p. 43). It is probably derived from Pioneer, above, from which it differs in its slightly darker foliage and even darker, larger pods, altho two strains of it grown here differed more from each other in minor details than either did from Pioneer. With us it was fully as early as Pioneer, though reported elsewhere as a day or so later; and gave as good, if not better crops.

Early Lexington (Ref. 27) appears to have been first listed in 1923 by Breck, is undoubtedly of Massachusetts origin and probably of the firm's breeding.

Described by the introducer as $3\frac{1}{2}$ feet tall, it grew at the Station to only $1\frac{1}{2}$ feet, and is therefore included with other second early, dwarf, wrinkled, cream-seeded peas. Pods start low on the stem, 7th or 8th node, are shorter than those of Pioneer, $2\frac{3}{4}$ to 3 inches long, dark to medium green, straight, very plump and well filled to the pointed ends, the dorsum also sloping so the tip of the pod is near the center; peas 5 or 6, very large, compressed, cylindrical, deep green, fine quality.

Although the pods are rather short and borne singly, they are well distributed and continue to mature for nearly three weeks, giving a crop ranking with the best of the group.

New Era (Ref. 28) was introduced by Williams in or before 1918. Tho called a straight-podded type, the illustration given and the pods as grown here show a decided curve toward the point of the pod. Neither pods nor peas were as good green with us as we anticipated from the introducer's description.

Pods about the same length, but less curved than those of Chelsea Gem, $2\frac{5}{8}$ to $3\frac{1}{4}$ inches long, plump, pointed or very long rounded at the end, and usually contain about 7 fairly large, flattened, oblong or cylindrical, light green peas. Two lots of seeds were secured, both from the introducer, which were cream without green in one case (seeds said to have been grown in Idaho) and green with little cream in the other (grown in Europe).

Height $1\frac{1}{2}$ to 2 feet tall; stems drooping enough to render support desirable; pods single, from the 11th node, matured as a rather late second early and gave good crops.

New Era gave fully as good, if not better, crops than Gradus on much dwarfer plants; but in 1927, under rather unfavorable conditions, the crop was no better

than good, much inferior to that of Duke Delight, grown with it.

Daisy.¹ Refs. 32-37. Daisy was sent in 1891 and later by Carter for testing by the Royal Horticultural Society, and has received several awards, tho not honored in 1925. It was introduced in 1892. It was about 5 years in reaching America but was soon widely distributed and is still considerably grown. It is said to be a cross between Stratagem and an unnamed pea, itself a cross between Culverwell Giant Marrow and Stratagem. Daisy and Dwarf Telephone, now probably inextricably mixed, were originally distinct. (See p. 61.)

Carter's Daisy was grown here for two non-coincident seasons from one of two different seed stocks, these two strains proving very similar, if not identical, altho the plants of one strain, possibly because of late sowing in a dry, warm season, were much more dwarf, and podded much lower down on the stem. In both of these strains, however, the plants were characteristically different from those of most other peas in this group, having large leaflets and very large stipules of a peculiar light, faintly yellowish, green color; and the upper joints lengthened slowly thus giving a top-heavy or bunched appearance of the upper stem. The strain grown from early planting in a comparatively moist season developed many basal branches, the other strain few or none.

Height, 10 to 12 inches, of branched strain, $1\frac{3}{4}$ to 2 feet; pods and peas of the two strains alike, pods from $4\frac{1}{8}$ to $4\frac{3}{4}$ inches long, very uniform for such large pods, broad, fairly plump, decidedly wrinkled when ready for use, straight or very slightly curved, not filling out to the edge but well filled to the pointed or very long rounded, tipless end; peas 7 to 9, large, smooth, round or slightly oval oblong, and light green in color, of excellent quality but slightly too thick-skinned as compared with peas of the Gem type; seeds very large, cream with a faint bluish or greenish tint and moderately wrinkled.

Seeds of a Daisy pea not specified as Carter's came to us from the Idaho Station, from which plants developed quite similar in general characteristics, but intermediate in some respects between the other two strains, as tall as the taller, but podding low like the shorter-vined type. The pods were nearly half an inch shorter than those of the other two strains, but otherwise similar and containing as many peas which, of course, were smaller.

The seeds sown were but little more than half as large as those of the two large-podded strains, but otherwise similar including a rather more noticeable bluish or greenish tint. The crop seeds were decidedly larger but still much smaller than crop seeds of the other two strains. Since we can find no record of any other Daisy than Carter's, we include this strain here; but if the name had been different, it would have been unhesitatingly accepted as another variety in spite of the similarities.

All strains gave only fair to good crops, because of the comparatively small numbers of pods. The season was the same, discounting differences in planting time and seasons — early midseason.

The Early and Improved types of Daisy have not been grown here under identifying names but possibly some of the strains have been of one or the other of the supposedly new types. Early Daisy is said to have

darker foliage, with narrower and lighter colored pods than Daisy. Usually such "improved" varieties have been found only well selected stocks of deteriorating older strains.

Lincoln. Refs. 38, 39; Thorburn *Cat.* 1908. The Lincoln pea was introduced by Lincoln, prior to 1908, in which year it reached America. It was "highly commended" in the 1925 pea trials of the Royal Horticultural Society and it reached the United States in that year. Seed of it came to the Station from Holland, thru Prof. Bushnell of the Minnesota Station, and was also purchased from two American seedsmen. The three strains proved alike tho differing slightly in size and shade of peas.

Height about 2 feet; stems distinctly branched, rather stout, holding up the pods very well, especially where drilled in for a canning crop; foliage abundant, and medium or dark yellowish green; pods start at about the 12th node, occasionally paired tho usually single, $3\frac{1}{8}$ to $3\frac{3}{4}$ inches long, rather narrow but usually plump, decidedly curved from base to tip, but occasionally straight, and well filled to the long-rounded, tipless end; much like Senator's in type; peas 6 to 8, large, compressed, oval, medium green, of fine quality; seeds small, 150 or more to the ounce, markedly cylindrical or almost square, well wrinkled and usually show a slight admixture of green with cream. The crops were very good, beginning in early midseason.

Allan Canner (Ref. 40), developed in recent years, is very similar to Lincoln. It is not quite as tall, branches less, has rather darker foliage, averages more leaflets, and these and the stipules are sharper pointed and with more prominent teeth. The pods start a node or two lower on the vine, are more often paired, are slightly shorter and more slender, and contain rather more peas, making these smaller. Because of the paired pods, the crops are better; and are ready at the same time as those of Lincoln.

Isbell Beauty. Refs. 41; and letter from Isbell, Jan. 27, 1927. Isbell introduced Beauty in 1920, it being selected from Kelway Beauty for earliness; and also has finely wrinkled, rather than dimpled seeds. As grown here it has been inferior to several other peas of this group, in size of pods, number of peas to the pod, yield and earliness. The peas are large and of good quality. The variety is of the dark-foliaged type, about $1\frac{3}{4}$ feet tall, with pods starting low on the vine, straight and pointed or very long rounded, broad but not plump and of fairly good color but rather coarsely wrinkled.

MEDIUM HEIGHT PLANTS

Admiral (Ref. 49) is said to be an English pea introduced into the United States in 1891 by Henderson. Tho no printed confirmation of this belief has been found, Admiral is apparently a selection, based on shorter vines and increased, shorter-period productivity, from Champion of Scotland, British Queen, or one of the Knight Marrows. Taller strains of the old Admiral resemble Champion of Scotland in practically all respects. As Admiral, Yellow Admiral, White Admiral and particularly as Green Admiral (introduced by Rogers),

¹ Daisy is included in this group because of its typical seeds, but the name is used for a section under the Large-podded Dwarf group characterized by vines of the Daisy type, light colored and "bunchy" at the top

this pea and its improvements are among the leading canning peas of the country, being grown for this purpose much more widely than in gardens, where they are surpassed by shorter-vined peas of the same pod size or by taller peas with larger pods.

Admiral is quite similar to Alaska in vine tho taller, and with heavier and darker foliage, and in pod shape, but the peas are larger, lighter in color, more crowded in the pod, 6 to 8 in number, often indented, light green in color, with delicate skins and far better in quality. The seeds are very small for wrinkled peas, cylindrical or square, indented, compressed and finely wrinkled, of even deep cream color. The Admirals give splendid crops about 10 days or two weeks later than those of Alaska, for the canners' harvest altho in the garden edible peas can be picked much earlier.

White Admiral and Yellow Admiral are evidently strains of the old Admiral pea, which differ from each other, if at all, only in slight but seemingly constant differences in the tint of foliage and in the shade of cream color of the seeds, and from the old Admiral in shorter vines, greater productiveness and more uniformity of pods, and in time of ripening.

Green Admiral. Refs. 50; *Seed World* 17:No. 13:18. 1925. Green Admiral, since its seeds are green, does not really belong in this group, but is included here for convenience in description. It was developed from the cream-colored form by Rogers and differs from the other types in being a day or two later in our tests, at least, slightly darker in foliage, shorter or at least less erect in earlier stages of growth, and having light green instead of cream seeds. The peas are generally considered of better quality than those of White or Yellow Admiral. Green Admiral ranks next to Advancer in yield for canning, and gives a larger proportion of peas in higher priced grades than does Advancer. It is not quite of the best quality.

Gradus (Refs. 58-61) is probably one of the best known peas in American gardens; but seems never to have become so popular in England where it originated. It is a Laxton pea, said to have received a First Class Certificate from the Royal Horticultural Society in 1887, but according to another reference, was not yet introduced in 1890. It also was awarded Highly Commended in 1925 tests of the Society. It came to America in 1897; and was called "Prosperity" as the result of a prize name contest by a leading American seedsman, and is still carried under that name by that firm and others, but was listed the next year by several seedsmen in this country under its true English name. As introduced in England it was said to be as early as William the First, to have pods of the same size and as well filled as those of Duke of Albany, with large peas of as good quality as those of Ne Plus Ultra. As grown at this Station from seed from various sources, it has been somewhat disappointing, being taller, rather later and not setting as heavily as was expected. It seems to be hard to keep down to medium height, as early English references speak of it as 2½ to 3 feet tall; but those after 1910, of which several record official tests, speak more often of 4, 4½ or even 5 feet than of shorter plants, and these figures correspond quite closely with those secured on Station grounds, where peas usually grow shorter, rather

than taller, than in many localities. Even when sown late, Gradus here requires about 60 days to first pods, making it a full midseason variety.

Height 4 to 4½ feet; rather slender stems, often branched at the base; foliage abundant to dense, medium green, decidedly blotched or marbled with white and comparatively free from bloom; leaflets usually 4 in number, small and regular in shape, and stipules very much larger, clasping the stem deeply, with rounded tips and shallow teeth; flowers abundant, large, white, beginning from the 9th to the 11th node, single; pod stalks very long, thick, often leafy; pods ¾ to ¾ inches long, broad, rather long oval in section, straight or slightly curved, with pointed or long rounded ends, no distinct tips; peas 5 to 8, large, oblong, somewhat indented thru crowding in the pod; seeds usually clear bright cream in color or in some strains with nearly one-third green seeds and well wrinkled. The peas are of fine quality and crops good; but the variety is exceeded in both respects by newer varieties of the Thomas Laxton, Laxtonian, and Gem types.

Gradus is generally classed with Blue Bantam, Dwarf Telephone, Laxtonian and others of the pointed-pod section of the Large-podded dwarf group; but color of seeds of the old type places it here. Length of vines would also exclude it from groups of dwarf peas.

A Dwarf Gradus is referred to in both England and America, with plants described as from 1¼ to 2 feet tall, but strains of these secured from the Pacific slope have been considerably taller, tho somewhat shorter than the regular strains of Gradus. They have also been somewhat earlier; but this has probably been due to late seeding and dry warm seasons.

Late Gradus is not included here, as the selection seems to have resulted in a green-seeded, tall pea of the Telephone type.

Alliance (Ref. 62) is generally called a synonym of Eugenie, next described; but according to the reference given it appears to have been a very similar but inferior pea, introduced the previous year by Harrison (1) as superior to his Glory which originated a year earlier still.

Eugenie (Refs. 62-66), a white wrinkled marrow, and Napoleon, green-seeded, are said to have originated from two peas in the same pod, the plants being grown about 1855 by Harrison (1). The varieties were identical except for the color of the seeds. Eugenie and Alliance, and similarly Napoleon and Climax, if once distinct, soon became inseparably mixed, both in England and America, each of the first pair of names referring to one white-seeded variety, and of the latter pair to the same green-seeded one. Eugenie reached America within 5 or 6 years after its English introduction, became widely distributed here and was still listed at least as late as 1913.

Grown at the Station in 1884 and 1886: Height 2½ to 3½ feet; stem slender, rarely branched; foliage deep green, of which the stipules, toward the base of the plants, were glaucous and washed with white; pods starting low on the stems, 5th or 6th node, single below and often paired above, on short stalks, tapering gradually to tip, variable in filling, being very poor below, often with only 1 pea, while above they may have 7 or 8, broad and rather flat, pale green in color. French references say the pods were slightly curved and ends rounded; and confirm poor filling of lower pods. The peas were of fine quality and quite large, the dried seeds averaging about 85 to the ounce, the crop very good, ready rather late and maturing very slowly.



A leading canners' pea

GREEN ADMIRAL

(Nearly natural size)



Well known garden variety

LITTLE GEM

(Two-thirds natural size)

As showing how little reliance can be placed on statements of time of ripening, comments on one extensive English trial say *Eugenie* is a second early pea, and *Alliance* (undoubtedly the same pea) third early; yet the figures given for this trial show that the two lots of seed sown 5 days apart in late April and early May gave edible peas a day apart only, and the third early was a day less in maturing than the second early.

An American tester claimed peas of *Eugenie* sweeter than those of *Napoleon*; but said the seeds of *Eugenie* were light green. Evidently the varieties were reversed.

Duchess of York. Refs. 76; *Rice Cat.* 1918. *Duchess of York* was introduced by Sutton in 1901, but seems to have been slow in coming to America, our first record of it being 1918. From its resemblance to *Empress of India*, it may be a seedling of that variety or a selection from it.

It was grown here from seed sent us by the Idaho Station and the University of British Columbia. Height $2\frac{3}{4}$ to 3 feet, often branched at the base and occasionally above; foliage only noticeable from its large broad leaflets in 4s and its larger, more whitened stipules; flowers small and not very numerous, borne from the 10th node up; pods single, $3\frac{1}{8}$ to $3\frac{3}{8}$ inches long, only moderately broad or plump (as seen on U. S. Department of Agriculture plats, the pods were better, being classed as plump examples of *Gradus* type), straight but quite irregular in shape, poorly filled and with pointed ends, sloping both front and back; peas few in number, 3 or 4 in a pod, dark green in color, very large, round or indented and oblong or flattened. The British Columbia seeds were much larger than those from Idaho, and the pods somewhat better filled tho no larger. From neither lot of seed were the crops more than fair.

The English descriptions prove this a pea varying quite widely in height, and in later trials at the Royal Horticultural Society gardens it was not considered worthy an Award of Merit which it received in its early days.

Profusion. Refs. 77; *Burpee Cat.* 1891. Arnold originated this pea, and Burpee introduced it in 1891, after previous preliminary distribution of packets for testing. It soon became widely known and considerably grown in America and also, to some extent, in France. The *Profusion* peas listed in England, however, are probably not Arnold's. It was grown at this Station in 1890 and 1893, but only brief notes on it are recorded. It was also grown here during three recent seasons, from the introducer's seeds.

Height, $2\frac{1}{4}$ to $2\frac{1}{2}$ feet; stem stout, support unnecessary, branched sparingly, both at the base and above; foliage abundant, medium green with rather small leaflets and stipules, scarcely if at all whitened; flowers from about the 14th node; pods single and paired, 3 to $3\frac{1}{2}$ inches long, moderately broad, quite plump, straight and well filled to the rounded or blunt, small-tipped ends; rather light in color; peas 4 to 7, whitish or light green, large, indented, oblong, of good quality. The crops began after midseason and could be rated only as good.

Prestige. Refs. 79; *Boddington Cat.* 1913. As *Prolific Late Marrow*, under which name it was sent to the Royal Horticultural Society for testing in 1901 by Jas. Veitch, *Prestige* received an Award of Merit. It was listed in America in 1913, but appears never to have been widely grown.

Seed of it was received here from McMillan, Mich., where it had been grown on the U. S. Department of Agriculture plats, with the note by Dr. D. N. Shoemaker that it appeared identical with *Royal Salute*; and the differences discoverable by comparison of the checked record sheets were less between this and two of the strains of *Royal Salute* than between these two and a third strain of that variety. The two varieties are probably not identical, but so similar that only most careful comparison of the two grown side by side from true-strain stocks could separate them. Seeds of *Prestige* were decidedly more green; but crop seeds of one strain of *Royal Salute* were also practically all green. For description, see *Royal Salute*, which follows.

Royal Salute. Refs. 80; *Dickson (2) Cat.* 1923; *Burpee Cat.* 1911. *Royal Salute* originated with Dickson (2) before 1902, and received an Award of Merit from the Royal Horticultural Society in 1916 but was denied one in 1922. It reached the United States in 1911, and has been considerably grown. Three strains of it were tested here recently, which differed quite widely in size and color of seeds and in size of pods but were sufficiently alike in other points to be considered as of one variety, particularly as much of the difference on some points disappeared in second crops grown from seed of the first year.

Height $2\frac{1}{4}$ to 3 feet; stem stout, sparingly branched at the base, foliage abundant to dense, medium to dark green with little bloom or little whitening of the four large to medium leaflets but much bloom on the whitened, sharp-tipped stipules; pods single or occasionally paired from the 14th node, on long, thick stalks, varying greatly in size from $3\frac{3}{8}$ to $3\frac{7}{8}$ inches for one strain to $3\frac{3}{4}$ to 5 inches for another, with the third strain intermediate between the others, straight, sometimes irregular or very slightly curved, with rounded ends, rather broad, plump, but not usually filled quite to the edge; peas 4 to 6 or 5 to 8, large, round or indented and somewhat oval or oblong, dark green, rather better in color than the outside of the pods would indicate, of good but not the best quality; seeds from medium in size to very large, moderately wrinkled, varying in color as noted under *Prestige*. It was late, requiring about ten weeks for the first pods even when sown very late.

Champion of Scotland. Refs. 81, 82; *Amer. Agr.* 18:174. 1861; *Hogg Gard. Yr. Bk.* 14:100. 1873. *Champion of Scotland* appears to be a pea of the *Ward Incomparable*, *British Queen*, *Fairbeard Nonpareil* or *Knight Tall White Marrow* type, considered when introduced as superior to *Champion of England* but white seeded. Hogg considered it identical with *Hay Mammoth*, which has many synonyms, including some which connect it with *British Queen*. It is credited to Lawson, who advertised it in 1859. It reached the United States almost immediately, but in 1889 was held to be synonymous with *British Queen*. *Scotch Champion* (p. 107) can hardly be a synonym. It must have desirable qualities to hold a place as late as 1889; and it is still available, as seed was sent here from the U. S. Department of Agriculture plats at McMillan, Mich., and grown in 1926.

As usual with English peas, it was much shorter on our soil, reaching only 3 feet; unsupported vines drooped or trailed but the tips of the enlarged stems grew quite erect, giving a peculiar appearance to the variety, the stems showing plainly thru the rather scanty

medium green foliage; flowers begin at the 14th node, on long, slender stalks and open widely making them very prominent; pods single, or rarely paired, about 3 inches long, slender but plump, very round in cross section, straight or very gently curved for their full length, very well filled to the square ends with large tips, light green in color; peas average almost 8 to the pod, very uniform, medium in size, much compressed and indented, oval from hilum to tip, and whitish green in color, holding color very well in cooking, only fair in quality, with little sweetness; seeds correspond to the peas in shape, are heavily wrinkled, and show a very faint bluish shade over the light cream color. The variety is late and matures slowly, the entire crop being only fair to good.

Prince of Wales. Refs. 85; Hogg *Gard. Yr. Bk.* 14:97. 1873; *Rural N. Y.* 43:737. 1884. Great confusion exists in pea literature in regard to Princess, Princesse, Princess Royal, Princess of Wales and Prince of Wales; but the relationships are probably about as follows: An old Prince of Wales, credited to Hurlstone, was introduced before 1846 and more or less grown for a decade. It is noticed under the Extra Early group, being apparently a good type of Early Frame. Princess was probably an erroneous American synonym for this pea; as neither Princess Royal nor Princess of Wales could very well have reached America when Princess was listed in 1861 as an "extra early." Princess Royal, a McLean pea, was introduced about 1860, was of the American Marrow type, and is described in that group. Sutton's Princess of Wales was a green wrinkled pea, much like Advancer, introduced about 1864. It is discussed on p. 104.

The Prince of Wales here described originated with Dr. McLean previous to 1865 as a cross between Beck Gem and some good marrow pea. He sold the stock to Turner and the latter placed it in commerce thru various seedsmen, including Sutton, so it is frequently known as Sutton's Prince of Wales. Hogg says Prince of Wales was a finely selected stock of Alliance, later and with better filled pods; but this statement may be based on external resemblance only, without a definite knowledge as to history. It was introduced into America about 1884 and has since been widely grown both in gardens and as a canners' pea. Two strains of it have been grown here in our tests, and an additional one on our canning pea plats. Only slight differences in the strains were noticed, these being largely variations in size of seeds and peas, but one strain was distinctly, tho very slightly, earlier than the other two strains grown beside it. One strain was exceptionally susceptible to root-rot.

Height about 3 feet, support desirable in row culture but the tips of the vines grow erect in the field so that the pods, starting above the 13th node, are readily harvested; foliage medium green, abundant to dense, not specially characteristic; pods often paired, from 3 to 3½ inches long, medium in width and plumpness, straight, hardly well filled, light in color, peas about 5, large, very smooth, oval-oblong, whitish green or light green, of good quality; seeds cream-colored, usually with some distinctly shaded light green, very large, round oval or oblong, coarsely wrinkled. It is a late pea, requiring 70 days to first filled pods in the garden and 80 to canning maturity, gives heavy crops in long, moist seasons, but suffers when hot weather sets in before the pods have begun to fill as happens frequently with a variety so late in maturing.

TALL PEAS

Hay Mammoth. Ref. 73. Hogg in 1873 said: "We have known this variety of pea for the last thirty-five years; and we cannot tell how long it had existed before that," but gives its history as having been first obtained by Anderson, from a small gardener in Battersea Fields. About 1873 it appeared as Ward Incomparable and was sold for a high price, and ten years later under the name Will Watch it brought two or three times its cost as Mammoth.

According to Hogg: Height 6 to 7 feet, very strong and vigorous, with three or four lateral branches when thinly sown, as long and productive as the main stem; pods produced in succession over a long season, generally in pairs, sometimes single, 3¾ to 4¼ inches long, quite broad, somewhat curved, blunt-ended with small tip, bright green in color; peas about 7, of delicious flavor, over half an inch long, nearly as wide and almost as thick as wide; seeds white, wrinkled. It was a most abundant bearer and latest of the marrows.

Fairbeard Nonpareil. Refs. 87; Burr *Fld. Gard. Veg.* 537. 1863. Fairbeard Nonpareil has had a long life, as it originated previous to 1853, was listed in England at least as late as 1923, and was grown here in 1926, from seed produced on the U. S. Department of Agriculture plats. In 1853 Fairbeard announced the intended sending out of Non Pareil that season, and it was advertised as new the following year by Sutton. It has a continuous record since that time, either in England or on the continent, but was probably never widely grown in America, altho described by Burr.

In our test: Height 3¼ feet; stems slender, occasionally branched at the base; foliage medium in amount and color, with 4 to 6 small leaflets and much larger, round-tipped stipules, neither whitened, but both glaucous, the stipules decidedly so; flowers small, appearing ruffled thru folded edges of the wing petals, from 13th node, either single or paired on very long, slender stalks; pods very uniform, short, 2½ to 2¾ inches or occasionally even shorter, narrow, or slender, but plump, straight or very slightly curved, very well filled to the square ends which have comparatively large tips, light green in color; peas averaging nearly 6, medium to small in size, smooth-surfaced, indented in the best filled pods, oval from hilum to tip, and light green in color; seeds indistinguishable from those of Champion of Scotland and British Queen. It is a taller pea than the former and rather earlier in season than the latter, coming in midseason, and still, tho past "three score years and ten," giving very good crops.

KNIGHT MARROWS

Although wrinkled peas existed before his time, Thomas Andrew Knight gave to the world the first group of named varieties of this type previous to 1828. The history of Knight's experiments with peas is given under the general history of peas (p. 8), and it is only necessary to say here that the Knight Marrow described below is probably the second of the six or more varieties he segregated: Tall and Dwarf,—White, Blue and Green,—Wrinkled Marrows. His Dwarf Marrow, with cream-colored seeds was first offered in America by Thorburn in 1828, so has been in existence over a century and known in this country for nearly that. It is no longer listed here; but seed of Knight Marrow from Holland came to this Station through the Minnesota Station in 1923; while Jenny Lind, regarded as a synonym, probably of the Tall White Marrow, was grown here in

1924 and 1925 from German raised seed. The two varieties differ only in height and season, the Knight (Dwarf?) Marrow being 3 to 3½ feet, and ready in mid-season, Jenny Lind being 1½ to 2 feet taller, and very late. Pods and peas of both are practically indistinguishable from those of Fairbeard Nonpareil. Jenny Lind was too late to produce well, the hot midsummer weather shortening production. It should be said that the Knight Marrow grown here recently was nearly twice as tall as Knight Dwarf Marrow described in the Station Annual Report for 1884, and the present-day pods were more square at the end and better filled with smaller peas than those grown 40 years ago. Neither then nor now were the crops as good as those recently secured from Fairbeard Nonpareil, though the differences may have been purely seasonal, since the Nonpareil was grown only in 1926.

Queen of the Marrows. Refs. 88; Hogg *Gard. Yr. Bk.* 14:96. 1873. This pea, offered by McMillan in 1868, is unknown in America, unless, as claimed the next year, it is identical with Ne Plus Ultra, which has been grown here. Ne Plus Ultra, however, has many distinctly green seeds, some with green under color; while Queen of the Marrows was said to be a very tall "white, wrinkled marrow." Hogg says Queen of the Marrows is merely a synonym of British Queen.

Earliest Marrow. Ref. 89. Veitch(1) introduced Earliest Marrow before 1907; but it is evidently not widely spread in England; and is unknown on this side of the Atlantic except as tested at the University of British Columbia and grown here from seed sent us by the University. With us it proved a midseason variety only, and too tall and too unproductive for popularity.

Height nearly 4 feet; foliage light green, large, considerably whitened and with but little bloom; flowers low for so tall a stem, 10th node; pods single only, 3 or 3¼ inches long, straight, quite broad, plump, fairly well filled, pointed, sometimes dorsally pointed also, of good, dark color, and fairly well filled; peas large, compressed, oval, well colored; seeds very large and distinctly oblong in shape.

Langport (Ref. 90) originated with Kelway and was introduced in 1913. It has been known in America since 1920, and was grown here during three recent

seasons. Tho cream seeded, it shows dark green color in both foliage and pods, but the former is much whitened.

Height 4 to 5 feet; stems stout, with a few medial branches; flowers at 14th node; pods single, as long as those of Alderman, rather broader, better colored and containing more peas. (It did better on the same soil than Alderman, the pod comparison being made with Alderman pods grown on richer soil.) The 5 to 8 peas are very large, smooth, round oval or oblong, and dark green. It is fully as early as Alderman, and when acclimated will undoubtedly be a better cropper.

British Queen. Refs. 91-97; *Amer. Gard. Mag.* 10:96. 1844; N. Y. Sta. *Rpt.* 3:243. 1885. Two slightly variant accounts trace British Queen to the Jersey Islands. The reference of 1844, above, says it was grown by P. Le Fauvre in the island of Guernsey; the other (Ref. 95) that peas found in some onions from Spain were sown and the progeny given to B. J. Saunders, Jersey, who propagated them and sold part of the crop to Lawson and part to Cormack, both lots under the name St. Peters Marrow, which Lawson changed to St. Heliers Marrow and Cormack to British Queen. Cormack advertised the pea in 1841, and it has been more or less continuously listed in England until 1913, at least, while seeds of it were secured, indirectly, from Holland, for testing at this Station in 1922. It was recorded in an American publication in 1844 and sold here in 1845, but probably is no longer grown commercially.

It is a taller pea than any of the group except Jenny Lind, previously described, reaching 5 feet, and is very late. The foliage is beyond medium green in color, but much whitened, comparatively free of glaucousness and large in both leaflets and stipules, the latter being very round in pair outline and blunt tipped, with few teeth; pods begin high on the basally branched stems, 22nd node, and are borne singly on long stalks, about 3 inches in length, of medium width and plumpness, slightly curved, poorly filled to the blunt or square ends which have small but noticeable tips, characteristically whitish green in color, with very smooth surfaces; peas 5 or 6, medium sized, round or oval, poorly colored. In our recent trials the seeds were small and much like those of several varieties previously described, but as grown here in 1884, they were much larger, about 75 to the ounce as compared with 120 now, much flattened and shriveled. The crops were also better then, the variety being called extremely prolific, while now it could be ranked only fair to good in productivity. It was said to be little affected by mildew, an essential point for late peas in most seasons.

GEM GROUP

This group might well bear the double name, Gem and Wonder; but for simplicity in reference the name of the older variety only is used. Two slightly different, but generally similar, types of pods characterize Little Gem, the old English variety, and American Wonder, the American one, to one of which most of the varieties of the group are related, directly or indirectly.

Both of these varieties are described in some detail, with special attention to pod characters, and the other varieties, so far as possible, are related, by difference or resemblance, to either the Gem or the Wonder type. As with most groups of wrinkled peas, the history of the group begins with Little Gem, since this originated from a cross between varieties very different from the type.

Little Gem. Refs. 1, 2; U. S. Pat. Off. *Rpt.* 1865. Little Gem, first of the really good dwarf, wrinkled peas,

originated with Dr. McLean before 1862, when it was introduced by Turner. Like others of Dr. McLean's seedlings, this probably was a cross between Beck Gem and "one of the best wrinkled marrows." It became popular, not only in England, but in France, Holland, Germany and the United States, which last it reached in 1865 or 1866, and where it still is listed and grown, tho now less than some others of the group.

Seeds small, about 130 to the ounce, finely wrinkled, oblong oval to almost circular from hilum to tip, flattened or indented, frequently like sections of a compressed cylinder, mostly light green to medium green, with a small percentage, varying with conditions, cream or bluish cream, with obscure radicles, and greenish cream to green cotyledons.

Height, with us, 1¼ to 1½ feet, with limits reported by others 1 foot and 2½ feet; stems stout, angular, smooth-surfaced, with short internodes, moderately branched near surface of ground and

below flowering node. foliage abundant, rather dark green with whitish veins and whitened areas, most noticeable on the stipules; leaflets large, regular in shape, usually in 4s, almost bloomless, stipules only slightly larger than the leaflets, clasping the stem deeply, sharp-tipped, serrate to above the middle and distinctly glaucous; flowers white, about the 8th node, only occasionally paired, on short, rather stocky peduncles; pods rarely paired, medium green in color, quite uniform, $2\frac{1}{2}$ to 3 inches long (within which limits all figures given by others fall), quite broad, plump, having a cross section between round and oval, quite regular in contour, smooth-surfaced, and usually well filled, both to the edge and to the end, which is rounded and bears a rather large prolongation or tip, frequently ending in a slender, curved point; peas 4 to 6, occasionally 7, rather irregular, medium sized, round or oblong, compressed or indented, medium green, of very good quality.

The season is early or very early for wrinkled peas, the first pods being ready in 52 to 56 days from late sowings or 57 to 60 days from sowings made as soon as is advisable for wrinkled peas. The pickings extend over nearly two weeks. In recent years, at least, Little Gem has not been very productive, the crops ranking as only fair to good.

American Wonder. Refs. 4, 5; *Gard. Chron.* 18:507. 1882; Denaiffe, *L. P. P.* 39. 1906. American Wonder originated about 1875 or 1876 with Arnold as a Little Gem x Champion of England cross, and was introduced by Bliss in 1878. This was the first real competitor of Little Gem, which had held the field for 15 years; but American Wonder became fully as popular, if not more so. It reached Australia in two years, England in three, and like Little Gem, soon found a place in most if not all Continental pea-growing countries. It is probably the most widely known American pea. Its earliness, small size, prolificness and fine quality gave it a place in the garden of practically every American pea lover; and the forceful advertising of its introducers brought it to the attention of foreign growers, who soon recognized its merits.

Seeds slightly larger than those of Little Gem, more nearly round from hilum to tip, rather thicker, with more of the "cylinder-section" appearance, and usually with a slightly greater percentage of the cream-colored type, more blue (or white) in the green of the skin, and more cream in the cotyledon color; plants more dwarf, $\frac{3}{4}$ to 1 foot tall in our tests, with others' limits, $\frac{1}{2}$ foot and $1\frac{1}{4}$ feet; stems stout, only slightly angled, internodes correspondingly shorter; branches rather fewer; foliage somewhat finer than that of Little Gem, and so clustered by the short internodes that stems and pod stalks are almost hidden, of the same color but slightly less whitened; with smaller leaflets and stipules, the latter being more often rounded at the tip. One observer says leaves are borne mainly on one side of the stalk, but this peculiarity was not noticeable on our stock. The flowers do not differ from those of Little Gem, but are borne singly, starting at about the 6th node; pods medium green in color, uniform, slightly shorter than those of Little Gem, scant 3 inches, with us and as noted by others) somewhat broader, giving a distinctly short, plump, "stocky" appearance, almost cylindrical, with blunt ends, and short, straight tips, quite unlike those of Gem, exceptionally well filled, averaging one pea more than Little Gem; peas 5 to 7, occasionally 8, larger because of the greater breadth and plumpness of the pods, but equally indented, rather better in color. The season is slightly earlier than that of Little Gem, rather shorter, and the yield much better.

The French improvement on this variety, American Wonder Long-pod, was distinctly taller in plant and with pods often in pairs, of the same length as the original, or when single possibly a quarter of an inch longer.

Premium Gem. Refs. 7-11. The exact date of origination of Premium Gem is uncertain; but it was

probably very shortly before 1877, when the variety was mentioned in an American periodical, in a note apparently copied from an English source. It was introduced by Carter and seems to be a selection from Little Gem without crossing. It is very like Little Gem, rather taller, reaching 2 feet, with pods longer by one-eighth of an inch, and somewhat better filled with slightly larger peas. Pickings begin at the same time but continue rather longer and the crops are decidedly better. Extra Early Premium Gem was considered merely a synonym in the early history of the variety; but in our tests the strain bearing that name was about two days earlier, coming with American Wonder, and a rather better producer.

Another strain is Darling Gem, which, being grown farther north, is taller, occasionally has 6 leaflets, flowers at 11th node, has longer, slenderer, more blunt-ended pods, occasionally slightly curved at the tip, often with one more pea to the pod, but of poorer color; is later and hardly as good a producer under our central New York conditions. Magnificent, of the Berry Seed Co., Clarinda, Iowa, is a rather large-podded, productive strain of Premium Gem.

William Hurst. Refs. 12-14; *Gard. Mo.* 26:112. 1884. William Hurst was listed by Hurst in 1882, presumably on its introduction. It probably originated with Laxton. It resembles American Wonder and may be a selection from that variety, tho some plant characters are more like those of Little Gem.

As grown at this Station in 1884 it was fully as dwarf as American Wonder, rarely branched, with lighter colored foliage and smaller leaflets, stipules more whitened, with pods less uniform in size, often small, and frequently curved toward the tips. It was very prolific, rather early and ripened slowly.

Seeds for our recent tests came from Holland, were much smaller than those of American Wonder, as were the peas, better green with only slight admixture of cream seeds, and almost as finely wrinkled as Premium Gem. The plants were taller than those of American Wonder, and straggling like those of Little Gem, as was also noted by some other authorities. As in the older tests there were many small pods, especially when paired, as they were quite often, being, in this respect, like Little Gem, or better. The pods were of the broad, round-ended American Wonder type, differing from those described by Goff. They were borne on the 7th or 8th nodes, were well filled, and produced abundantly over a long season, as in 1884, making very good crops. The small peas were crowded in the pod, showed wrinkling while still edible, were of light, shining, medium green to light green color and splendid quality. It appears to be one of the best of the older varieties of the group, and is still listed and grown. It is later than either Gem or Wonder.

Station. Refs. 15; *N. Y. Sta. Rpt.* 3:236. 1885; *Gregory Cat.* 1895; *Thorburn Cat.* 1895. The Station pea resulted from a cross between American Wonder and Earliest of All, made at this Station in 1883 by Prof. E. S. Goff.

It preceded Gregory Surprise by several years, but the two varieties were almost inseparable, the later one was better advertised and the name Surprise won for the merged stock of the two, Station becoming obsolete or only a synonym. True stock of it no longer exists.

Comparison with the Gem varieties will be found under Surprise; but according to early authorities, definite, slight differences separated Station and Surprise. Both foliage and pods of Surprise were somewhat darker green than those of Station; its pods were wider in proportion to length, longer necked and ventrally curved while the sides of Station pods were parallel; and the peas of Surprise were crowded giving them a "shouldered," or cylinder-section appearance like that of the Gem peas. Surprise was also considered the better bearer of the two.

English Wonder. Refs. 36; *Gard. Chron.* 13: 716. 1893; S. Dak. Sta. *Bul.* 91:5. 1905. English Wonder was raised by a gardener named Tipping, Kenilworth, Eng., and introduced about 1891 by Cannell. It was brought to America by the U. S. Department of Agriculture for its tests in 1904 and introduced commercially shortly afterward. It is probably a selection from American Wonder, or from a cross with it.

As grown here the plants are considerably taller, about 1½ feet; with rather more angular stems; rather lighter colored foliage, having leaflets more often in 6s, and sharp-tipped, rather than round-tipped, stipules clasping the stem more deeply; with less conspicuous tendrils; blossoming much higher on the stem, 12th rather than 6th node, with pods more often paired, rather longer and more uniform, slightly more slender, not quite so blunt-ended, smoother-surfaced and darker colored, and occasionally with one more pea to the pod, 7 instead of 6. The peas are slightly larger, and the seeds decidedly larger than those of American Wonder, but of the same general character, moderately wrinkled, and cream and light green in color. It was about three days later than American Wonder and not quite as good a bearer, tho giving very good crops. Aside from productivity, it seems better than the older variety; and some others have found it more productive.

Recent reports indicate that in England stocks of English Wonder are much mixed with seeds producing peas like American Wonder.

Nott Excelsior. Ref. 37. This pea originated with Richard Nott, Burlington, Vt., as an American Wonder x Advancer cross; and was introduced by Gregory in 1891.

On Station soils it has been as tall or taller than Little Gem, 1½ to 1¾ feet, tho generally said to be intermediate in height between Gem and Wonder. It is usually compared with Premium Gem and Little Marvel, but for sake of uniformity, we note its variance from Little Gem, as grown with it in our tests.

The plants are rather more erect than Gem, tho still tending to droop; have some branches, usually basal; foliage similar but with broader leaflets and less clasping stipules, both decidedly whitened but with the white veins less noticeable; flowers from about the same node, or one higher, 9th, rarely paired; pods very similar to those of Little Gem, occasionally slightly longer, but averaging rather shorter, 2½ to 2¾ inches, more often somewhat curved, with slightly more pointed ends, better colored, and averaging better filled; larger peas; seeds somewhat lighter in weight than those of Little Gem, oblong, indented or almost square in shape, and lighter in color, being greenish cream, with similar cotyledon color. With us it was slightly later than Little Gem, but somewhat more productive.

It is usually said to be earlier than Gem or Wonder, more productive and more resistant to climatic extremes.

Surprise. Refs. 42-44. Surprise originated with Horsford about 1889, from a cross similar to that which

produced Station six years before, Earliest of All x American Wonder. After eight years of selection to secure plants producing the best filled pods and most wrinkled peas, Horsford disposed of the stock to Gregory, who introduced it in 1897. The non-identity of Station and Surprise is discussed under Station.

The plants of Surprise are like those of Alaska and Extra Early, being taller than those of Little Gem, 2¼ to 2½ feet, rarely with a medial branch; foliage scanty, slightly darker than medium green, considerably whitened, with rather long leaflets and sharp-tipped stipules only slightly larger than the adjoining leaflets and rather deeply clasping; pods borne singly from about the 8th node up, on rather slender stalks of moderate length, rarely reach 3 inches, almost round in section, plump, blunt to square at the ends, with small, straight tips; peas when in well grown pods (as they seldom have been here), average 5 or 6, small to medium sized, rather oblong, indented or almost square, medium green in color and of very good quality; seeds small in most strains, 160 to 180 to the ounce, but may occasionally run as large as 140 to the ounce. Surprise is very early, requiring only 7 weeks to maturity when sown late, or 7½ to 8 weeks when sown in late April or early May on heavy soil near Geneva. It is one of the earliest wrinkled peas, often used for canning. Were its productivity equal to its other good qualities it would be very extensively grown; and some heavy-yielding strains have been developed. Unfortunately its yields are variable, and often only good or below; and it is only moderately resistant to pea diseases.

Witham Wonder. Refs. 40; S. Dak. Sta. *Bul.* 85:5. 1904. Witham Wonder originated with Cooper-Taber, possibly as a selection from English Wonder, from which it differs mainly in having curved pods. It was introduced about 1895, was brought to America for U. S. Department of Agriculture tests in 1903 and introduced commercially about five years later. It was grown here in recent tests from seed from the Idaho Station and from Holland. The seeds of the two strains differed somewhat, those from Holland being larger, more wrinkled and better green, but these differences disappeared in crop seeds of the first season; and plants of the two strains were similar.

Seeds, even of the Holland strain, were smaller than those of English Wonder and better green in color; plants about half a foot taller, 1¾ feet, similarly branched, with darker, more dense foliage, very free flowering from 8th node up, with pods on longer, rigid stalks, frequently paired, longer, sometimes 3¾ inches, usually 2¾ to 3½, much curved, rather more pointed but generally with long-rounded ends, not always quite as well filled, but averaging more peas to the pod, 6 to 7 as compared with 4 to 7. The peas are decidedly smaller, about 80 to the ounce as compared with 55, indented or flattened by crowding, wrinkling early, not as well colored, but of excellent quality. Witham Wonder is about three days earlier than English Wonder, but rather later than Little Gem, very productive and picking over a long period.

Little Marvel. Refs. 45; Gregory *Cat.* 1911. Whether the Little Marvel grown in America is Sutton's pea of that name, or Carter's, if these are not the same, is unknown.

Sutton's Little Marvel was introduced in 1900 and the Little Marvel we have did not reach America until 1908, when Gregory received such a pea from Carter. Its parentage is given as Wm. Hurst x Daisy. From 1911 to the present time Little Marvel has been widely grown in America, and both before and since that time has been frequently commended in English publications,

receiving two or more Awards of Merit from the Royal Horticultural Society.

As grown here it is from $1\frac{1}{2}$ to $1\frac{3}{4}$ feet tall, like Little Gem in stem and branches but rather more erect, with rather smaller leaflets only slightly whitened and with stipules clasping the stem lightly only; with prominent tendrils; flowers large, from near the ground, 2nd or 3rd node; pods paired as well as single, on short, thick stalks, pods almost identical with those of Little Gem, shorter when paired, heavier, and with longer, pointed ends and the typical long, curved tips of Little Gem; much darker in color than those of Gem; peas somewhat larger; seeds much larger, even exceeding those of American Wonder, but much more wrinkled. It should be said that Sutton's and Carter's illustrations of Little Marvel show "stockier" pods with blunter ends than we have been able to secure in our tests; and some American descriptions make the pods blunt-ended. The pea has been almost as early as American Wonder, and exceedingly productive. Little Marvel is among the best of the peas of this group. Laxton's Little Marvel Improved (*Roy. Hort. Soc. Jour.* 52:107, 1927) is a mixed stock, with broader podded and curved-podded types.

Rivenhall Wonder. Refs. 48; Maule Cat. 1905. Rivenhall Wonder received an Award of Merit from the Royal Horticultural Society in 1903, when sent by Cooper-Taber and seed of it was secured for American distribution in 1905 when it was probably first sold in England. It is said by various authorities to be "of the Gem class," "an improved American Wonder," and "an improved Witham Wonder." As Witham Wonder was also a Cooper-Taber pea, Rivenhall Wonder is probably a selection from it. Seed of it sent here from British Columbia gave a very poor stand, so original plant descriptions were not secured.

In England. Height $2\frac{1}{2}$ feet; stem very robust, dark green; foliage and pods dark green. In America "10 inches tall" or "4 to 5 inches taller than American Wonder," with short internodes and dense foliage.

As we grew them, pods 3 to $3\frac{3}{8}$ inches long, broad, moderately plump, straight, with long-rounded ends without tips, medium to deep green in color, not always well filled; peas averaged 5 or 6, large, light green, seeds of British Wonder type but more compressed and thinner, making them weigh one-tenth less, much larger than those of Witham Wonder, and more wrinkled than those of American Wonder. It is decidedly later than most of the class, a midseason or even late midseason variety, but said to be very productive.

Early Excelsior. Ref. 50. Excelsior, or Early Excelsior, as Gregory named it in 1906, is undoubtedly an English pea, as the introducer compares it with Nott Excelsior, "its American cousin;" but we have been unable to ascertain its English source. It is not Sutton Excelsior. We have grown Excelsior from British Columbia seeds and Early Excelsior from the introducer's stock, and find them essentially identical.

The variety is like Nott Excelsior, but earlier, 47 to 50 days from late May sowing, or 56 days from earlier planting; with larger pods and peas, 3 to $3\frac{1}{4}$ inches instead of $2\frac{1}{2}$ to $2\frac{5}{8}$, and 45 to the ounce rather than 70; with stouter vines $\frac{3}{4}$ to 1 foot tall; and a better producer giving better than good and very good crops. The seeds

weigh 105 to the ounce, 30 less than Nott Excelsior, and are very similar in color and shape to those of British Wonder.

Richard Seddon. Refs. 54; and letter of J. A. Campbell, Director of Horticulture, N. Z. Department of Agr., May 18, 1926. Richard Seddon originated with F. Cooper, Wellington, N. Z., about 1912 and was named for the representative there of the British Government. It appeared in several American catalogs in 1913, and was at one time in considerable favor here and in Canada.

As grown here, of Little Gem type of branches and foliage, with a stouter, less angular stem $1-1\frac{1}{4}$ feet tall, flowering at the 7th node and producing single pods on short, stocky stalks, of Wonder, rather than Gem type, $2\frac{7}{8}$ to $3\frac{1}{4}$ inches long, but uneven, with many small pods only $2\frac{1}{2}$ inches long, slightly curved, with pointed to rounded ends and distinct straight tips, wrinkling early, not always well filled, but when perfect with 6 to 8 medium sized, oblong, indented peas, dark green in color and of fine quality. The seeds are of Gem type, but remarkable for the "cylinder section" appearance. The variety was fully midseason in maturing pods, and not productive. It is evident that marked strain differences exist, as some, particularly the originator, found it as early as American Wonder, others a few days later than the Gems.

Duke Delight (Ref. 56) was introduced by Routledge in 1918, coming originally from New Zealand. It was named for one of the firm whose "nickname" was "Duke." It is very similar to American Wonder, not quite as early but maturing more uniformly. It was the most productive pea, for the size of the plants, of any in the group; and one of the best table peas in color and quality.

It varies somewhat in height, from $\frac{5}{6}$ to $1\frac{1}{4}$ feet, these limits being noted in different seasons; flowers from the 7th or 8th node, and bears both single and paired pods. These varied, in the two seasons, $2\frac{5}{8}$ to $3\frac{1}{8}$ inches long in 1926, $2\frac{7}{8}$ to $3\frac{1}{4}$ in 1924, but were uniform in each season, very plump or "stocky," occasionally saddle-backed, straight, blunt to square at the end with a small, straight tip, slightly wrinkled when ready to pick, good green in color, and averaging 6 or 7 very large, oval, indented dark green peas of the best quality. The seeds are practically those of Little Gem enlarged one-fifth and noticeably of "cylinder section" shape from compression in the pod.

Canners' Gem (Ref. 57) originated with Allan probably about 1920.

It is of Little Gem type of stem, considerably taller, $2\frac{1}{4}$ to $2\frac{1}{2}$ feet, with strong basal branches; foliage less whitened, sometimes with 6 leaflets, and with more round-tipped stipules; tendrils are quite prominent, long and slender; flowers begin well up the stem, 14th node; pods borne toward top of plants, in pairs and singly, on long, quite heavy stalks, much longer than those of Little Gem, $2\frac{7}{8}$ to $3\frac{1}{4}$ inches, appear more slender but are plump, perfectly straight and with parallel sides, blunt at the ends and with small straight tips, more like Wonder than Gem in these last characteristics, light green in color, almost always well filled; peas 5-8, small or medium sized, oval, indented, light green to medium green, of fine quality; seeds smaller than those of Little Gem and often of decided cylinder section shape. The season is later than that of Little Gem and the yield not high, but it grades well for canning. It is not a good garden variety, because of the poor distribution of pods and short season.

LARGE-PODDED DWARF GROUP

This group of garden peas is of comparatively recent origin. The oldest varieties in it, and these not quite typical of the group, are less than 50 years old; and more than three-fourths of all have originated during this century, in response to the modern demand for the combination in single varieties of all desirable pea

qualities: Ease and economy of handling in both cultivation and picking; heavy yields; early and continuous production; or, for canning peas, nearly simultaneous readiness of most of the crop; large, attractive and well-filled pods; and peas of the highest quality.

The varieties of the group have resulted from crosses;



A plump-podded type

DUKE DELIGHT

(Two-thirds natural size)



CANNERS' GEM

(Two-thirds natural size.)

but unfortunately modern breeders, unless with decidedly scientific leanings, have not generally given the parentage of the varieties originated; and the histories in this group are more lacking in accurate breeding data than those in many other groups. With innumerable varieties to work with, each showing many characteristics, and few of them purified from Mendelian recessives, several combinations of parents, of the comparatively few known, have appeared quite unlike in character groupings, yet have resulted in new varieties sufficiently alike to come well within the limits of the group, and in some cases to be very similar. This diversity in parentage, known and unknown, makes any genetic grouping of the varieties impossible; so that the group, in its three sections, is merely a collection of varieties similar in general appearance and horticulturally useful characteristics, all having wrinkled seeds, usually mixed in color. The first section includes the comparatively low-growing, semi-dwarf or dwarf types, with pods above medium in length, generally straight, but occasionally slightly curved, broad, seldom very plump, and with ends long rounded or pointed, having small tips or none. The pods are quite similar to those of the Telephone group, usually shorter and relatively broader, but in a few sorts, longer and appearing more slender. The second section is very similar to the first, but with pods rounded, blunt or square at the ends, usually with distinct tips, and often more plump than those of the first group. The third section is separated from the others by vine characters mainly, being decidedly more dwarf in early stages and showing a "bunchy" or clustered appearance due to the slow lengthening of the upper internodes before flowering which masses the rather heavy foliage and developing pods at the top of the stem.

Of the first group, Dwarf Telephone (*incorrectly* used as a synonym of Daisy), World Record, Laxtonian, and Peter Pan, are among the best known, and are described in detail, the characters of the others being indicated more briefly as showing differences or resemblances of these varieties to one or the other of those more fully described.

POINTED-POD SECTION

Dwarf Telephone. Refs. 6-10. The true Dwarf Telephone originated in 1888 from a Stratagem x Telephone cross, made "by one of the most careful propagators in the United States," apparently not a member of the Allan firm, by whom it was introduced. Later the cross was said to be between Improved Stratagem and Improved Telephone. Carter Daisy is usually regarded as identical with Dwarf Telephone, but the two varieties originated on opposite sides of the Atlantic in different years and from different parentage. Stratagem was common to the two, but the other parent of Dwarf Telephone was Telephone; and of Daisy, a seedling from a second Stratagem cross. The seeds of Dwarf Telephone are mixed cream and green, those of Daisy clear dark cream, with an almost brownish shade.

As grown here Dwarf Telephone was $2\frac{1}{4}$ feet tall; stems moderately stout, internodes short, making support unnecessary,

but allowing the upper part of the plants to droop or trail; usually branched both at the base and near the middle of the stalk; foliage abundant, medium green, not whitened nor noticeably glaucous, made up of small, regular leaflets in 4s and stipules only slightly larger than the leaflets, lightly clasping the stem, sharp-tipped and with shallow teeth to above the middle. The plants did not show the clustered effect of the upper leaves and buds so characteristic of Daisy. Pods began somewhat irregularly, from the 7th to the 12th node, being lower on unbranched stems, almost always single with us, but occasionally paired elsewhere, $3\frac{1}{4}$ to $3\frac{3}{4}$ inches long, in other tests 4 or $4\frac{1}{2}$ inches, medium or greater in breadth, quite plump, oval in cross section, smooth or finely wrinkled at picking time, straight or slightly curved, with ventrum less arched than that of Daisy, filled to the tip and nearly to the edge, rounded to long rounded at the end, which bears a large, straight tip; only medium green in color and the walls rather too thin to hold freshness well; peas 5 or 6, occasionally more, medium to large in size, quite uniform in the pod, smooth, round or slightly indented, oval to oblong vertically, between light green and medium green in color, of excellent quality. The season was decidedly earlier than that of Telephone; but the yield was not as good.

Early Morn. Refs. 15, 16; S. Dak. Sta. *Bul.* 91:5. 1905; Dreer *Cat.* 1905. Early Morn was introduced by Carter in 1897, received an Award of Merit from the Royal Horticultural Society in 1899, was tested by the United States Department of Agriculture in 1904, and was commercially introduced in the United States the next year. It has been quite widely grown in England, and to some extent in this country.

Early Morn was grown here from the introducer's seed and from American grown seed. The domestic strain was much inferior to that from English seed, so the description is based on the latter alone.

Of Dwarf Telephone type, it was much taller, 3 feet; stem much more slender making support necessary for best results, less branched; foliage less abundant, both leaflets and stipules considerably whitened or tinted with yellow, stipules larger than those of Dwarf Telephone, somewhat glaucous, very deeply clasping and rounded at the tips; tendrils less prominent; flowers cream colored, small and few in number at any particular time, borne singly, beginning at the 8th node; pods average shorter, more uneven in length, broader, straighter, not so well filled, and with more pointed ends, frequently showing a dorsal slant to the point, as well as ventral, light to medium green in color, with little bloom; peas slightly larger, more oblong, of rather poor color and with a tendency to wrinkling while at the picking stage, making it necessary to pick early before the pods were fully filled, if the quality is to be retained; seeds larger and more wrinkled, mixed cream and green. Crop ready a full week before that of Dwarf Telephone but yields only fair.

World Record. Refs. 32; Leonard *Cat.* 1913. World Record originated with Sutton before 1907, when first listed, from a cross between Harbinger and Early Giant. It reached the United States in 1913 or earlier. It became quite well known in this country but is not now as popular as some other varieties of the group; since it seems somewhat irregular in behavior, succeeding well in some seasons or some localities and poorly in others. Tho grown from three seed sources and in different years at the Station, we succeeded in getting only one fairly representative crop; and even with this the pods were small. The description here given, therefore, is to some extent compiled, especially with respect to dimensions.

Height $2\frac{1}{4}$ to $2\frac{1}{2}$ feet, occasionally more; stem short-jointed but rather slender, with occasional basal branches only; foliage

scanty; medium to abundant; light green, without bloom, considerably whitened, composed of small leaflets in 4s and of slightly larger, blunt-tipped stipules, cut for about half the outer margin with small teeth, and clasping the stem lightly; tendrils inconspicuous; flowers began at the 7th or 8th node, white with a distinct bluish shade; pods single, on long, slender stalks, broad, plump, round to oval in section, straight, somewhat wrinkled, light in color, pointed, sometimes dorsally pointed also and without distinct tips, in our tests much shorter than as usually described, $2\frac{1}{2}$ to 3 inches long, while English references give lengths as great as 6 inches, and other American ones from $3\frac{1}{2}$ to 5 inches. Unless very long, the plumpness of the pods gives them a stocky or stubby appearance exceptional in pointed pods; and the long rounding of the ends makes them appear somewhat curved; peas 5 to 7, large, handsome, round to slightly indented, oval, light green in color, of excellent quality; seeds much larger and more wrinkled than those of Dwarf Telephone and largely cream colored. The crops were almost first early and when the pea was successful, better than good.

Laxtonian. Refs. 37; Allen, Sterling & Lothrop *Cat.* 1913. Laxtonian was introduced by Laxton Bros. before 1907, and was brought to America six years later. It is becoming well known and very popular. Three strains of it were grown in our recent tests, and found to be satisfactorily uniform, the differences noticed being of little horticultural importance.

Height $1\frac{1}{4}$ to $1\frac{1}{2}$ feet; stems stout, short-jointed, unbranched or occasionally branched both at base and above, erect or slightly drooping; foliage medium to abundant, rather dark green, with leaflets in 4s, noticeably variant in size, and stipules slightly glaucous and whitened, only slightly larger than the leaflets, round-tipped and serrate to about the middle; tendrils not prominent, usually rather slender and much curled; flowers white, of medium size, usually single but occasionally paired, beginning from 6th to 8th node, on long stalks when paired, of medium length when single, and rather slender; pods mostly $3\frac{3}{8}$ inches long, but occasionally only 3 inches, quite broad, moderately plump varying from round to broadly oval in section, straight or slightly curved toward the tips, occasionally somewhat depressed between the peas, with long-rounded or pointed ends, sometimes dorsally slanted to the ends, also, and with a distinct to small, straight or slightly recurved tip, and filled to the edges but not quite to the tips; peas average 5 or more, large, round or somewhat indented, oval to oblong, almost dark green, of splendid quality except for slightly tough skins; seeds not quite as large as those of World Record, about 105 to the ounce, about equally dark cream and light green in color, very well wrinkled. It is a second early variety, about with Little Marvel and Premium Gem and a few days to a week ahead of Gradus (Prosperity) and Thomas Laxton; and usually a good to very good producer.

Pioneer (Sutton Pioneer). Refs. 24, 25 of Wrinkled, Cream-Seeded group, 39; Gregory *Cat.* 1916. Of three English "marrowfat" Pioneer peas, Eckford's 5 feet high and introduced in 1906, Webb's, $3\frac{1}{2}$ feet, introduced before 1912, and Sutton's, introduced in 1906, the latter, alone, seems to have been grown in the United States, which it reached in 1916.

It is an improved type of Laxtonian, $1\frac{1}{4}$ to $1\frac{1}{2}$ feet tall, and unusually robust, with light green to medium green foliage and somewhat darker colored, long, very slightly curved pods, with long rounded to pointed ends, sometimes also dorsally pointed, and small or no tips. It is said to be similar to Peter Pan, but with rather narrower, less uniform pods; and to produce heavy crops.

Discovery. Refs. 40; Burpee *Cat.* 1915. Discovery was introduced by Sutton in 1910, and was brought to America in 1915. While in general habit

somewhat like Laxtonian, it is much longer podded and somewhat later, being more like Sutton Superlative.

Compared with Laxtonian, as both grew here, it is about one-third taller, $2\frac{1}{2}$ feet; stem more slender, much enlarged above, drooping or almost trailing but succeeding fairly well without support, more often branched; foliage with bluish shade, glaucous but not whitened, consisting of large, broad leaflets in 4s and 6s, and very large, wrinkled, round-tipped, deeply clasping stipules, distinctly tinted bluish; tendrils large and prominent; flowers began higher, about the 12th node, borne singly on short, heavy stalks; pods massive, longer, $3\frac{3}{4}$ to $4\frac{3}{4}$ inches, broad, almost plump, showing considerable coarse wrinkling, straight, with rounded ends with a short, slightly dorsal slope to a small, but distinct slightly recurved tip, somewhat lighter in color than the foliage, usually well filled to the tip, but not to the edge; peas 6 to 8, very large, smooth, oblong, dark green, of fine quality; seeds also very large, 85 to 90 to the ounce, oblong, flattened, moderately wrinkled, and varying in color from almost pure deep cream as received from Idaho, to medium green with some bluish cream as furnished by an American seedsman, or deep green to greenish cream, coming from England. Sown in late May, Discovery required nearly 9 weeks to produce marketable pods, or 10 weeks if sown two weeks earlier. It gave only good crops.

Peter Pan. Refs. 42; Thorburn *Cat.* 1912. The first reference found to Peter Pan is in an American catalog in 1912; but it was apparently introduced in 1910 by Watkins & Simpson, London, England, and received a Certificate from the Royal Horticultural Society in 1920. It has been much listed in the United States and is still extensively grown in home gardens and, to some extent for market, because of its good yield, fairly early, of beautiful large pods.

As grown here: Height $1\frac{1}{2}$ to $1\frac{3}{4}$ feet; stem stout but slightly drooping, branches few, basal; foliage abundant, almost dark green, very much like that of Laxtonian in shape; flowers at 5th to 7th node, single, on rather short stalks; pods of about the same length as those of Laxtonian, $3\frac{1}{4}$ to 4 inches, similarly wide and plump, but distinctly curved toward the point and without distinct tips; not filled quite as well in our tests, but equally well colored; peas very similar, noticeably long oblong, in each variety; seeds not quite as finely, tho fully, wrinkled. Peter Pan and Laxtonian are the same in season, and the former a rather better producer.

Blue Bantam (Refs. 44-47) was introduced by Burpee in 1912.

It is so similar to Laxtonian in every way that descriptions of the two varieties, made independently, would not separate them. One comparison of them, made by a large grower of seed peas, makes Blue Bantam taller, a day later, and with pods a quarter of an inch longer than Laxtonian. Under our conditions, Blue Bantam was shorter than one strain of Laxtonian, taller than another, was one or three days earlier, and gave length measurements of 4 inches maximum, and $3\frac{1}{2}$ to $3\frac{3}{4}$ inches for the run of a very even lot of pods, while the two lots of Laxtonian gave $3\frac{1}{2}$ to $3\frac{7}{8}$ inches for general run and 3 inches minimum for pods of one strain and $3\frac{3}{8}$ to $3\frac{7}{8}$ inches, with the same minimum, for the other strain. The foliage of Blue Bantam showed some leaflets in 2s, and often with square tips. Only occasional basal branches were noted; but one strain of Laxtonian showed no branches, the other both basal and medial.

If Blue Bantam and Laxtonian were originally distinct, they have approached each other with age, or

seed mixtures have occurred, so that purification of each variety would be necessary to re-establish the differences between them.

Giant Laxtonian, with us, gave pod measurements of $4\frac{1}{4}$ inches maximum length, ordinarily $3\frac{3}{8}$ to $3\frac{7}{8}$ inches. It is essentially identical with one or both of the preceding.

Marchioness (Ref. 53) originated with Sharpe and was announced in 1913. It reached America by 1918 at latest, and has been considerably grown. Two strains of it were grown here, both justifying the description "an early Gradus."

In plant very similar to Early Morn, tho slightly shorter, $2\frac{3}{4}$ feet, without medial branches and with rather larger leaflets and decidedly larger stipules, both light in color and decidedly whitened; flowers at the 8th or 9th node in each variety, but much whiter in Marchioness; pods single, on long, rather slender stalks, some slightly longer than those of Early Morn, but averaging the same for the general run, 3 to $3\frac{3}{4}$ inches, of similar shape, but much lighter in color; peas in two strains were dark green; seeds of one strain nearly all light to medium green in color, but those from another source were nearly all dark cream. The two lots varied much in size, 83 and 126 to the ounce.

Marchioness was quite early, coming between first and seconds, and was also very productive. Were it not for the rather light color of its pods and its height, Marchioness would be one of the best peas of this group.

Harvester (Ref. 54) apparently originated with Ford, was sent out in small samples for trial in 1914, and regularly listed in 1915 by several firms. As grown here in recent tests it was mixed in type.

In general dwarf, $1\frac{3}{4}$ to 2 feet, stout-stemmed, unbranched, with foliage of Blue Bantam type, but rather smaller leaflets; blossoming higher on the stem, 10th node, and with rather longer and plumper pods, more abrupt at the end and containing more and larger peas, usually indented by crowding; peas of fair color and quality only: seeds rather small, 125 to the ounce, somewhat coarsely wrinkled and mixed dark cream and light bluish green in color. It was a second early or early midseason variety and gave rather better than good yields.

Progress (Ref. 58) originated with Laxton Bros. and was introduced in 1922. It reached the United States in 1924 and is already gaining popularity. It promises to be, even for America, one of the best of this group; as it is early, dwarf, productive, and has large, attractive pods and very large peas of splendid quality. It is not yet quite pure in type.

May be distinguished from Peter Pan, to which it is most similar, both bearing curved pods, by being at least a week earlier; and from most of the other varieties by the curved pods, dwarfness and earliness, united in none other of the group. The seeds of Progress are exceptionally large, broadly oblong, compressed but thick, with many more of medium green color than of cream color; and well, but coarsely, wrinkled.

Were it not for rather poor filling under some conditions, Progress would undoubtedly become a leading home-garden, as well as market-garden pea.

Thos. Laxton introduced a Progress pea, of Ne Plus Ultra type, fifty years before his successors gave the name to the new variety described above.

Onward and **Trailblazer** are new peas belonging to this group; not yet sufficiently tested for accurate description; nor have their histories been secured.

BLUNT-PODDED SECTION

Thomas Laxton. This pea, as grown in America, except on heavy soils and under favorable weather conditions, would be classed here; but at its best here, and in England, the plants are too tall for a dwarf or semi-dwarf group; so Laxton is described under the Ne Plus Ultra (p. 72).

The leading varieties in this section are old and very well known; but none is sufficiently characteristic to be used for fundamental reference. They are Yorkshire Hero, Horsford Market Garden and Sutton Excelsior; all characterized by large, blunt-ended pods, with noticeable tips.

Satisfaction. Refs. 63; *Ann. Hort.* 103. 1889. Satisfaction was introduced about 1844, by Sutton; and brought to America in 1889 by Johnson & Stokes. In spite of its age it was given an Award of Merit in 1916 by the Royal Horticultural Society, is still listed in America, and was grown in our recent tests.

In plant much like Sutton Excelsior, but in pod and pea very much larger: rather taller, 2 feet, with less abundant foliage, less whitened, the leaflets occasionally in 2s only; pods uneven, averaging $3\frac{3}{8}$ to $4\frac{1}{8}$ inches, with some a quarter inch longer or more than half an inch shorter, very broad, fairly plump, straight or very slightly curved, with short-rounded ends and small tips, dark green in color; peas 6 to 8 in well-filled pods, very uniform, medium to large, round or slightly indented, oval, light green, of good quality: seeds as sown large, round, oval or almost cubical, not deeply indented and about equally cream and green — as harvested much larger, more oblong, more flattened, and practically all good medium to dark green in color.

Satisfaction was not ready until late midseason, and did not give a good crop, tho elsewhere reported as yielding well, as it must have done to hold place so long. In England it bears paired pods but rarely does so in the United States.

McLean Best of All. Refs. 65; *Thorburn Cat.* 1873; *Hogg Gard. Yr. Bk.* 14:99. 1873. McLean Best of All was introduced in 1870 or 1871 by Dr. McLean and apparently was soon handled by other seedsmen. It came to America very promptly as it was listed in 1873. It is quite distinct from Sutton Best of All, but as both peas were handled by the same firm, the synonymy has become much confused. McLean Best of All was grown at this Station in 1884, but was not found for our recent trials.

In the 1884 test it was 2 to 3 feet tall, with stocky stem, short internodes, basal and medial branches, deep green foliage decidedly whitened, glaucous on stipules, pods frequently paired, 2 to 3 inches long, slightly recurved, short-rounded at the ends, lighter green than foliage, and containing 4 to 6 whitish green, oblong, somewhat compressed peas; seeds quite large, 72 to the ounce, cream to very pale green in color and much wrinkled. The variety was prolific, very late, and matured rather slowly. The pods in English and French references are described as much longer; so the variety is placed in this large-podded group.

Hogg groups this with McLean's Premier, but says plant is not as robust nor pods as large.

Yorkshire Hero. Refs. 66-72; *Country Gent.* 37:134. 1872. *Hogg Gard. Yr. Bk.* 14:109. 1873. A few references where height is given as $3\frac{1}{2}$ to $4\frac{1}{2}$ feet, would place this pea in the Ne Plus Ultra Group; but most English figures and all American ones, make it a dwarf or semi-dwarf pea; so it is included here. York-

shire Hero originated with Dickson (3) about 1862, and reached America about 10 years later. It is still much grown in both countries, Laxtonian and Sutton Excelsior being the only peas of this group more often listed in America. It is widely grown on the Pacific Coast. It was tried at this Station in 1884, in 1893 for World's Fair display, and in our recent tests. The descriptions as far as details were given for the early trial, agree almost perfectly. It is evidently very well established in type.

Taller than Horsford Market Garden, $2\frac{1}{2}$ to 3 feet; stem stouter, holding plants more erect; foliage rather less abundant, with a bluish tint over the dark green, with long leaflets usually in 6s, and sharp-tipped stipules; flowers higher on the stem, 14th or 15th node; pods sometimes paired, borne on moderately long, heavy stalks, very slightly longer than those of Horsford, 3 to $3\frac{3}{8}$ inches, uniform, rather broader, and with round to blunt, rather than blunt to square, ends; peas seldom exceed 5 in number, among the largest, almost square by compression, oval to oblong longitudinally, and light green in color; seeds nearly twice as large as those of Horsford, much indented but still quite thick, broadly oval to oblong, from very light cream or bluish cream to light green, moderately and rather coarsely wrinkled. It varies but little in season from Horsford Market Garden, sometimes rather earlier; and still gives very good crops tho the pods are not always well filled.

Hogg says indistinguishable from Prolific Long-pod except for green seeds.

Austral, mentioned without description in a Pacific Coast seedsman's list, is described in the 1922 catalog of F. Cooper, Wellington, N. Z., as an improved, dark green, giant-podded Yorkshire Hero, $2\frac{1}{6}$ feet tall, superior in size, color and flavor, with much larger, more attractive pods, a week or more earlier and quite as hardy.

Dwarf Champion and Dwarf Champion of England. Refs. 73-76. Whether one variety or two are designated by these names, is now impossible to say; or, at least, to say which of the two or more strains of Dwarf Champion now grown corresponds to either name.

As grown at this Station in 1888, Dwarf Champion of England seems quite distinct from Dwarf Champion grown in 1884; but Gregory in his catalog of 1885 uses both names for the same variety.

From the early Station descriptions Dwarf Champion of England is short-stemmed, with very short internodes and remarkably short peduncles, 1 inch, supporting $1\frac{1}{2}$ to 3 inch pods, borne high on stem, paired, numerous, distinctly paler than foliage, straight, very plump, but not always well filled, with tip toward center of pod; peas 3 to 6, very large and much compressed; seeds much flattened and wrinkled, mostly white.

Dwarf Champion was 1 to 2 feet taller, with rather slender stems, internodes sometimes 4 inches long, and peduncles 2 to 3 inches, with single pods $2\frac{1}{2}$ to 3 inches long, very blunt at apex, slightly paler than the foliage, with 4 to 6 whitish green peas and small, very much wrinkled seeds showing two shades of cream.

In recent tests, two Dwarf Champions show somewhat similar differences in height of plant, $1\frac{1}{2}$ to 2 feet, and $2\frac{3}{4}$ feet respectively, in node of first flower, 11 and 16-17, but the pods differ by only about a quarter-inch in length, tho pea and seed differences, especially in size of seeds sown, are more marked but tend to disappear with cultivation under the same conditions.

The pods of the small-seeded strain are more like those of the Gem Group, of the large-seeded one more like Stratagem; but owing to the similarity of name and possible identity of varieties, it has seemed best to place both in this group and section. Both strains were raised by the same raiser and were rated as fair or good in

Horsford Market Garden. Ref. 77. This well-known and useful canning pea is also widely grown in private and market gardens. In 1879 Horsford crossed Alpha and American Wonder and from one pea of three in a pod produced Racket, and from two of them grew Market Garden. The two plants selected were so much alike that both were used to develop stock for the new variety, which was introduced in 1883 and 1884. The description of the variety as grown at the Station in 1884 differs from that made in our late tests only in pods shorter by more than a quarter-inch, containing fewer and larger peas, and ripening over a longer season, these changes evidently being due to selection in the variety in recent years for canning-crop needs. From the three strains grown here the following description is made, modified slightly by differences noted elsewhere in large-area growth.

Height of plant 2 to $2\frac{1}{2}$ feet; stem moderately stout, round at the base, angular above, with short internodes, drooping, support useful but not necessary in garden culture, unnecessary in the field, branched both at base and above; foliage abundant to dense, dark green, small regular leaflets in 4s, occasionally in 5s, rarely whitened or glaucous, and slightly larger stipules rounded or even blunt at the tips, clasping the stem rather lightly, somewhat whitened and slightly glaucous, with quite large, wide teeth half way up the outer edge; tendrils rather prominent; flowers white, from about the 9th node, single or in pairs on long, heavy stalks; pods short-necked, arising from receptacles small for the size of the pods, $2\frac{7}{8}$ to $3\frac{1}{4}$ inches long with us, under better conditions $3\frac{1}{4}$ to $3\frac{1}{2}$ inches, rather broad, plump, giving round oval or almost round cross sections, ventrum and dorsum very slightly curved in parallel, making an almost straight, regular pod, blunt or almost square at the end, with a rather prominent tip, between light green and medium green in color; peas 7 to 8, above medium in size, round or slightly indented, oval, medium green in color, and of very good, but not the best, quality; seeds small, from about 130 to 145 to the ounce, round oval, distinctly indented but quite thick, finely wrinkled, usually fairly even light green in color with one-fourth or less light cream.

Horsford Market Garden is a late midseason variety maturing for table use in about $9\frac{1}{2}$ weeks. It ripens quite promptly and is usually second only to Advancer in productivity as a canning crop pea; tho in short, dry seasons Green Admiral may outyield it.

Sharpe Queen. Refs. 79, 80; Gregory Cat. 1890. This Queen pea is said to have originated with Culverwell, but the name of its distributors was added, who advertised it in 1886. It was brought to America about 4 years later by Gregory, and has been widely grown in both countries. It was tried here from seed sent us by the University of British Columbia, but satisfactory vine description was not secured.

As grown elsewhere: Height, 2 to $2\frac{1}{2}$ feet, of sturdy, branching habit, so it may be sown thinly; foliage dark green; pods $3\frac{1}{2}$ to 4 inches long (with us, 3 to $3\frac{1}{2}$ inches), fairly broad and plump, slightly curved, with rounded to blunt ends, very dark green, too often not well filled; peas in well-grown pods, 5 or 6, huge, dark green, oval, oblong, and flattened, of fine quality. It is ready for use about with Horsford Market Garden, but not very productive.

Rennie Queen (Ref. 79a) was also sent by the University of British Columbia; appears very similar to Sharpe Queen; but in our test had even larger, oblong peas, which were not as well colored. Rennie's catalog emphasizes quality of pea, and habit of setting pods low and bearing freely. The variety does not appear



A favorite old pea

SUTTON EXCELSIOR

(Two-thirds natural size)



A leading canners' pea

ADVANCER

(Two-thirds natural size)

in recent catalogs of the firm. Whether the Queen listed by Northrup or the Queen described under the Telephone group, is either of the above, cannot now be ascertained. The former apparently belongs in this group tho rather tall, $3\frac{1}{2}$ feet, and probably in this section.

Sutton Excelsior. Refs. 86, 87; Farquhar *Cat.* 1902. This Excelsior originated with Culverwell about 1887 from a Paragon x American Wonder cross, and after being grown and watched for 10 years was introduced in 1896 by Sutton. It was brought to America in 1902 by Farquhar. It has been widely grown in both England and America and is still listed by at least a hundred seedsmen in this country. Probably thru its popularity over a quarter of a century Sutton Excelsior has developed markedly different strains; as noted here, and as will be seen from figures given for the variety by two leading seed growers: Height, A, $1\frac{1}{2}$ feet, B, $2\frac{1}{4}$ feet; pod length, A, $3\frac{1}{4}$ inches, B, 4 inches; time to table use, A, 64 days, B, 80 days.

Owing to these differences, we have selected for description the strain grown here from seed from the Minnesota Experiment Station, where special studies of garden peas had been made. This strain seems in most characteristics midway between differing extremes. Height, $1\frac{3}{4}$ to 2 feet; stem stout but drooping, with short internodes, many branches both basal and medial; foliage varying with the strain, abundant to dense, dark green, with leaflets in 4s, large, broad, slightly glaucous, little or not at all whitened, and stipules considerably larger, round-tipped (sharp-tipped on one strain), lightly clasping, with teeth to mid-margin, decidedly whitened and quite glaucous; tendrils not prominent; flowers from 6th to 8th node, white or show a slight bluish shade, borne singly on short, thick stalks; pods rather uneven in length, sometimes $3\frac{5}{8}$ inches, but mostly 3 to $3\frac{3}{8}$ inches, broad, only moderately plump, very slightly curved, not filled to edge but filled to the rounded or blunt, straight-tipped end, smooth or slightly wrinkled on the surface, light green in color (other strains show darker pods); peas 4 to 6, large, indented, oblong, yellowish green or light green, of good, but not the best flavor; seeds rather large, oblong, flattened, well wrinkled, cream and light grayish green in color. With us all the strains are almost, but not quite first early, the usually considered second early, and, as noted above, in some instances fully midseason; and all gave good to very good yields.

Reading Gem (Ref. 101) was introduced by Sutton in 1922; and was grown at this Station in 1926 from seed from the U. S. Department of Agriculture plats at McMillan, Mich. It is a promising variety, probably not yet commercially introduced in America.

Rather distinct in type, only 1 foot tall, very vigorous; stem stout, erect, unbranched; foliage abundant, medium to light green, decidedly glaucous and much whitened on the stipules, with leaflets medium in size and regular in shape, and stipules very much larger, with rounded tips, serrate on about one-third of the margin, moderately clasping, flowers from 6th node, medium to large, creamy white with green center, on moderately short, medium stout stalks; pods long, usually $3\frac{1}{2}$ to $3\frac{7}{8}$ inches, but occasionally less than 3 inches, moderately broad, very plump, sometimes thicker than broad, slightly saddle-backed, straight, blunt at the ends, with large tips, light green in color; peas 4 to 8, averaging 5 or 6, very large, scarcely indented, oblong or wedge-shaped, medium green in color, of fair to good quality; seeds very much like those of Sutton Excelsior but rather more wrinkled. It is a first early in season and bears well to very well.

DAISY SECTION

Tho the section is named from Daisy, this pea is not described here. It has already been treated under

the Wrinkled, Cream-seeded Group, where better placed, the character of the seeds being generally of higher determinative value than habit of growth. The peculiar "bunchy" character of the upper part of the plants, due to retardation in development of the internodes between the higher blossoming nodes, shown markedly in the old Crown pea, has led, however, to several peas being called "Daisy type" peas or said to be "similar to Daisy," and the large-podded peas so characterized have been placed in this section. With this characteristic in mind, in grouping of the leaves, buds, flowers and young pods more or less in clusters at the tips of the stems, with usually a lightening or faint yellowing of the developing upper leaves — to justify inclusion of the variety here, the other plant and pod characters may differ markedly from those of Daisy; so that descriptions cannot be related to that variety as has been done in other groups in which one or more type varieties combined many characters common to several others of the group.

British Wonder. Refs. 91–104. British Wonder was raised by Berberry, a seedsman of Kenilworth, Eng. It was introduced by Taber and Cullen about 1890, and is probably a selection from American Wonder; it was sent to the United States Department of Agriculture for trial in 1903 by Squier and was introduced in the United States by Burpee, in the following year, after growing seed from an original English stock for several years. It was grown here recently and proved quite like the introducer's description:

Rather taller, $1\frac{1}{2}$ to 2 feet; stem stout, rigid, erect, with a few drooping branches; foliage abundant, medium green, unwhitened, somewhat clustered at the top like Daisy, with leaflets in 5s and 6s, rather large and broad, and slightly larger, round-tipped, moderately clasping stipules, serrate to above the middle; flowers at 7th node; pods single, on long, medium heavy stalks $3\frac{1}{8}$ to $3\frac{1}{2}$ inches long, medium in breadth and plumpness, wrinkling rather early, straight, usually well filled, with blunt ends and distinct straight tips, medium green in color, not specially attractive; peas 5 to 8, large, seldom dented, oval or oblong, dark green in color, of good quality; seeds large, 80 to the ounce, in about equal proportions cream and semi-smooth or little wrinkled, and green and well wrinkled. The variety apparently differs in pea quality with the varying proportions of cream and green seeds, as they were reported very sweet in cooking tests at South Dakota Station in 1903, and medium in sweetness the next year. It is a midseason variety, giving a good yield.

Buttercup. Refs. 105; Stumpp & Walter *Cat.* 1913. Buttercup originated with Carter about 1904, probably as a selection from Daisy, of which it is said to be a hardy form, with smoother seeds. It might be placed with the dimpled-seeded peas. It reached the United States in 1913, was soon listed by several firms and is still retained by about as many, tho never very well known. As grown here it was a marked illustration of the change in seed character possible in a single season, those sown being only moderately dimpled and rather dull cream in color while those harvested were larger, well wrinkled and with more light green than cream-colored seeds. It showed the "Daisy" clustering of foliage quite decidedly.

More dwarf than British Wonder, with more medial branches, but none from the base of the stem; foliage glaucous, dense, with

leaflets in 4s, overlapping, rolled and crinkled, and stipules rolled and crinkled; pod stalks shorter and thicker than those of British Wonder; pods smoother, rather longer, broader, not as plump, often slightly curved toward the tip, with pointed or rounded, tipless ends, medium green in color; peas 5 to 7, smaller, round or slightly indented, long oval or oblong, medium green in color. It was later than British Wonder by a few days to a week, but from its smoother seeds, might be sown earlier. It was about the same in productivity.

Connoisseur (Ref. 112), which is entirely distinct from Laxton's Ne Plus Ultra type pea of that name, was introduced in this country in 1914 or 1915 by Ferry, who secured the seed from Cooper-Taber.

In plant habits very similar to British Wonder; $1\frac{1}{2}$ to 2 feet tall; stem stout; branches basal and medial; foliage rather darker green, distinctly whitened; flowers from 8th instead of 7th node, frequently paired, with heavier stalks; pods possibly a trifle longer and very uniform, broader and not quite as plump, with long-rounded points, medium green in color, about as well filled; peas of similar size and shape, but not as well colored.

It is later than British Wonder by a full week, and produced about as well, only good crops.

Sutton Supreme (Ref. 113) was introduced in 1921 by Sutton; has been grown at this Station from British Columbia seed; and in United States Department of Agriculture tests; but has not been cataloged in this country.

Height $1\frac{1}{2}$ to 2 feet; stem square, heavy, with short internodes, particularly above, few small medial branches; leaflets large,

broad, light green covered with bloom and with marked white areas, rounded at the base, almost straight at the sides and deeply, sometimes doubly, notched at the tips; stipules huge, very deeply clasping the stem, bloom and whitening intensified and veins distinctly whitened; the light cream flowers not opening fully, single, from 12th or 13th node, and, with light-colored new leaves, and developing pods, are clustered at the top of the stem; tendrils heavy and moderately curled; pods $3\frac{1}{2}$ to $3\frac{3}{4}$ inches long, broad, very plump, straight, blunt-ended with small tip, very dark green in color and well filled to the tip, tho not always to the edge; peas 5 to 7, very large, oval, oblong, dark green, of very good quality; seeds large, dull, bluish cream and light green, well wrinkled. Supreme is a second early or midseason variety, yielding very well.

Superb Early Dwarf (Ref. 114) has been grown here from seed supplied by Griswold (1), by whom it was first listed in 1922.

About half a foot shorter than Connoisseur, unbranched, with rather less abundant, medium green foliage bunched at the top, with leaflets in 4s and long rather than broad, much larger, sharp-tipped stipules with few teeth, lighter in color than the leaflets, both leaflets and stipules being whitened and glaucous; flowers begin at 6th node; pods single on short, thick, stalks, $2\frac{1}{2}$ to $3\frac{1}{4}$ inches long, broad, plump, straight, well-filled both to the edge and to the square, small-tipped end, wrinkling early and light green in color, keeping only moderately well; peas 4 to 7, fairly large, indented, oblong, light green in color, of only fair to good quality; seeds decidedly smaller than those of Connoisseur, oblong, flattened, fairly well wrinkled and mixed cream and green in color.

Superb Early Dwarf is a second early pea producing only fair to good crops.

ADVANCER GROUP

The Advancer group of peas began with this very well-known pea, now perhaps the favorite, with growers, of all wrinkled canning peas. As with several other groups, little or no history can be given back of the type variety, as this was a cross and decidedly unlike the known one of its parents, or any pea likely to have been the other parent. Several of the varieties mentioned in the group probably have no inheritance relationship with Advancer, but are included because of general similarity in essential horticultural characters.

As the type variety is oldest, it is first described in considerable detail, with the later varieties discussed in chronological order of first known date, and their distinguishing characteristics, only, emphasized.

Advancer. Refs. 1-3; *Rural N. Y.* 11:159. 1860; Bliss *Cat.* 1866. Dr. McLean made many crosses between Beck Gem and some of the best marrows (wrinkled peas) of his time; and turned over to Turner most of the varieties developed. Among these was Advancer, which Turner introduced in 1860. The *Rural New-Yorker* spoke of Advancer in the same year, but it was probably not introduced in the United States until 1865, by Bliss. The variety spread slowly in America at first, but by 1875 was well known, and with the development of the canning industry has become widely spread. It is now little known in England, where its lack of high table quality has almost retired it in favor of dwarf peas of sweeter taste and more delicate flavor or of taller varieties with fine peas in huge pods. For growers of canning peas, the productivity of Advancer and the tonnage given by the large peas make it a prime favorite; but the canners themselves prefer varieties that

do not harden so rapidly at maturity, that grade better, and that give canned goods of better color and quality.

Advancer has been tested here for two or more seasons, both in the garden and in our canning crop plats from seed grown in various localities. These strains varied considerably, especially from the financial standpoint, in the canning crop tests, where variations in the size of seed directly influenced the number of vines to the acre, and indirectly but even more noticeably, changed the relative proportions of the different grades of peas.

In general, the characters of Advancer are about as given below:

Seed green with a small percentage cream colored; decidedly but somewhat coarsely wrinkled; oval in long diameter and distinctly flattened or compressed, often like short sections of a slightly flattened cylinder; with obscure radicles and green cotyledons; height 3 to $3\frac{1}{2}$ feet, but some strains much shorter, vigorous; stem stout, angular, with internodes of medium length, usually branched both near the ground and near the flowering node; foliage medium to abundant, dark to medium green, rarely whitened, consisting of medium sized, rather long leaflets in 4s and 6s, scarcely glaucous, and stipules only slightly larger, with sharp tips and a few small basal teeth, more glaucous than the leaflets; flowers start at 12th to 14th node, white, of medium size, single or frequently in pairs on long, moderately thick stalks; pods numerous, quite uniform, from $2\frac{3}{4}$ to $3\frac{1}{8}$ inches long, medium to narrow in width, plump, smooth or slightly wrinkled when ready to pick, round to oval in section, straight, filled to the edge and to the blunt or square ends, which bear rather large straight tips, somewhat lighter in color than the foliage, about medium green; peas 6 or 7, medium to large, round oval or short flattened cylindrical, light green to medium green.

Advancer has been one of the best yielders of all peas grown, with pods ready to pick in the garden in 58

to 60 days from late sowing or in 63 to 65 days from earlier sowing. For the canners' harvest, from 70 to 74 days are required in ordinary seasons, the pods maturing quite uniformly. An Improved Advancer, cataloged since 1918, at least, is slightly more dwarf than the old Advancer, more vigorous, with darker, more abundant foliage, rather shorter but plumper pods, and better color in both pods and peas.

Alpha. Refs. 6, 7; *Gard. Chron.* 70. 1870; *Roy. Hort. Soc. Jour.* 12:35. 1890; *Thorburn Cat.* 1870; *Hogg Gard. Yr. Bk.* 14:104. -- 1873. Alpha differs somewhat from Advancer, but is included in the group as more like Advancer than like any other well-known pea. It originated with Laxton about 1867 and was said by Carter, its introducer, to be from a Laxton Prolific x Advancer cross; but Laxton later gave the parents as Little Gem and Ringleader. It created quite a furor and was widely grown in England, in France and in America, which it reached in 1870. Hogg's description and figure of Alpha would place the variety in the Senator group, the pods being decidedly curved and rather slender and the peas small.

It was grown at this Station from 1882 to 1884, and also in our recent tests from English seed.

It was earlier than Advancer, more slender-stemmed, rarely branched, with scanty, light green foliage and pale pods, which were shorter and broader than those of Advancer and sometimes slightly curved at the tip. It was not very prolific, but matured its crop promptly. The peas were very large and poorly colored.

Bliss Abundance. Refs. 11, 12; *Rural N. Y.* 43:52, 99. 1884; *Burpee Cat.* 1893. Bliss Abundance, one of the best known peas of American origin, was,

surprisingly, introduced first in England about 1883, by Howcroft & Atkins, London. It is said the American originator or introducer (which, is not stated) received \$1,000 for the seed sent to England. Abundance originated with Arnold, and was introduced by Bliss, who announced it for sale in America in 1884. It soon established itself and is still considerably grown.

It was very dwarf when first introduced, from 1¼ to 1¾ feet, but like most varieties not rigidly selected it has increased in height, now generally exceeds 2 feet, and often reaches 3 feet, but is usually half a foot shorter than Advancer under similar conditions; foliage rather more abundant and darker, with slightly larger stipules usually somewhat whitened, and with leaflets very rarely in 6s; pods more frequently paired, slightly longer than those of Advancer (3¼ inches); peas 8 in the better pods instead of 7 in Advancer. It is slightly later than Advancer and bears as well if not better, in garden tests at least; but the strain used on a canning pea plat was inferior to Advancer in every way.

Canners' Perfection (Davis' Perfection) is an improved Abundance pea, a selection made several years ago by W. A. Davis, then an employee of the Rice Co.—apparently better suited to canners' use than the original strain. Its pods are slightly longer than those of Abundance, very plump, not quite so blunt-ended and with smaller tip, better colored, and with more and smaller peas, which are also darker green. The foliage is more dense than that of Abundance, and the leaflets usually in 6s. It bears lower on the vine and the pods are often paired.

Bliss' Abundance, rather than Sutton Abundance, is probably the variety tested by the Royal Horticultural Society in 1926. (*Jour.* 52:42. 1927.)

STRATAGEM GROUP

This is one of the smaller groups of peas, and of somewhat indefinite limits, as the medium-sized pods, with the rounded ends and sharp points rather than definite tips, of Stratagem pass by imperceptible gradations to the larger pods of the Telephone group or its dwarf representatives of the Gradus and Laxtonian types; to the large square-ended pods of the tall-vined Ne Plus Ultras or the more dwarf Thos. Laxtons; and to the curved-podded representatives of other adjoining groups. Peas of this group differ from those of the Advancer group mainly in shorter, more bushy plants, long-rounded rather than blunt-ended pods, and rather more coarsely wrinkled peas.

As the parentage of Stratagem is unknown, the history of the group begins with the variety, which seems to have been a rather distinct break in type from those current when it originated.

Stratagem. Refs. 1-5; *Rural N. Y.* 42:149. 1883; Johnson Seed Co. *Cat.* 1909. Stratagem was introduced about 1879 by Carter, and was probably a selection made by them from Telephone or Telegraph. Wm. Culverwell, originator of Telegraph, claimed, also, to have found in stock of that variety grown by him, plants that could not be distinguished from Telephone, and others that were identical with Stratagem, both varieties introduced by Carter. Stratagem differed from

Telegraph in better wrinkling of the seeds, and from both Telegraph and Telephone in dwarfness of plant, and in having shorter, straighter, less pointed pods.

Danby Stratagem, introduced by Carter about 10 years later, and several Improved and Re-Selected Stratagems listed by other seedsmen, have been almost indistinguishable from well-grown and well-rogued stocks of the original variety. The sporting tendencies of Stratagem have always made it a difficult pea to keep true to its best type; and have led to its practical abandonment in recent years, tho when introduced it was called the "finest pea in the world" and it received twice the highest award from the Royal Horticultural Society, an honor said not before to have been awarded any variety. Stratagem first reached America in 1883, Improved Stratagem in 1896, and Danby Stratagem in 1909. These stocks have now become inextricably mixed, in America, at least; and no recent small-scale tests can be relied on to separate the strains.

The variety was tried at this Station in 1884: Height 1½ feet; stem remarkably strong, angular, often with medial branches, rarely with basal; with internodes rarely exceeding 2 inches; foliage rather abundant, deep green, much whitened near the base of the plants, remarkably compact near the top of the stem, more or less waved and twisted, similar in some ways to Daisy; pods usually single, on short stalks, of same color as foliage, 2½ to 4 inches long, often somewhat irregular in shape and rounding very gradually

at the ends; peas 4 to 9, large, very pale green, slightly oblong, much compressed; seeds pale green or almost creamy white, much flattened and wrinkled, about 81 seeds to the ounce.

Neither season nor productivity was stated; but other American references of about that time say it was a midseason pea and very productive, tho one grower said it did not yield enough to make a satisfactory market garden pea. In 1893 (Bul. 69) Stratagem was found here to be of "first quality, fine flavor." The vines were tall, compact, vigorous, and the variety a "good cropper," tho late.

Several strains of Stratagem, Danby Stratagem and Improved Stratagem have been grown in our recent tests; and the points supplementary to the early description, or differences from it are indicated below:

Height $1\frac{1}{2}$ to 3 feet (Danby and Improved strains toward higher limits); branches very rarely both medial and basal, often medial, occasionally lacking; foliage abundant to dense, darker than medium green, whitened slightly on leaflets, considerably on stipules, leaflets usually 4, of medium length but rather broad, stipules varying from much larger than leaflets at base of plant to only slightly larger above, moderately to lightly clasping, with heavy teeth below middle, and with rounded tips; tendrils quite prominent; flowers above 12th or 13th node; pods single on short, rather heavy stalks, $3\frac{1}{2}$ to $4\frac{1}{2}$ inches long, moderately broad, almost plump to plump, smooth or slightly wrinkled in a vein-like arrangement, straight and straight-backed, with dorsum almost parallel but rounding almost equally to very short neck and rather long-rounded end, with small straight tip, medium green in color; peas 7 to 9 in well-filled pods (too rare), large, oval or oblong and round or slightly indented, medium green, of fair to good quality; seeds only coarsely wrinkled, of medium size, mixed cream and light green. The pods were ready in midseason, or later, and in no case were the crops better than good.

Sharpe Triumph. Refs. 7, 8; *Rural N. Y.* 44:496. 1885. Sharpe Triumph originated with Culverwell, was named and introduced by Sharpe in 1883, and reached America within two years.

It was grown at this Station in 1888 and appears to have differed from Stratagem in more compact habit of growth — dwarfer, with shorter internodes — and shorter and more uniform pods containing more, and more flattened, seeds. The principal difference, however, was in a decided curving of the pods of Triumph, which considered by itself would exclude the variety from this group; but some references, English, American and French, say the pods were straight, while others in the first two countries agree with the Station description.

Dwarf Defiance (Ref. 11) was raised by Laxton and was first known as John Lee, under which name it received the highest commendatory award of the Royal Horticultural Society in 1892. The stock, before this time, had been purchased by Sutton who gave the variety its current name, and introduced it after re-selection. In 1901 it received an Award of Merit from the Royal Horticultural Society under the new name. It was grown in America in 1904 in the Department of Agriculture tests, but was not introduced commercially under its own name for several years, tho Potlatch, introduced somewhat before Dwarf Defiance appeared in the United States, is said, by some, to be identical with the latter. Dwarf Defiance, as grown here:

Rather more dwarf than Stratagem, $1\frac{1}{4}$ to $1\frac{1}{2}$ feet (elsewhere reaches 2 feet and in England $3\frac{1}{4}$ feet); pods occasionally in pairs, broader, with a slight curve at the tip, which is somewhat more pointed, dark green in color, and better filled; peas larger, of better quality, more compressed than those of Stratagem; seeds decidedly larger and much flattened.

Dwarf Defiance was about 3 days earlier than Stratagem; but the crops were rather disappointing, tho elsewhere in America they have been heavy. It is considered a very satisfactory dwarf main crop pea.

New Life (Ref. 12) was introduced in this country in 1896, probably by Breck. Gregory says the originator sought to secure a new pea with all the good points of Stratagem without the defect of small pods; and New Life resulted. It was much commended and soon became very popular but was also soon superseded by other varieties. It was 2 to $2\frac{1}{2}$ feet tall, in season about with Stratagem or a little earlier, very prolific, with long, straight, broad pods, $3\frac{1}{4}$ to 4 inches long, containing 5 to 8 large peas of good quality. It was a Stratagem improved in productivity and regularity of pod size.

Sherwood. Refs. 15, 16; *Thorburn Cat.* 1908. Sherwood was introduced about 1901, probably by Hurst, and received an Award of Merit from the Royal Horticultural Society in that year. The first American reference is dated 1908. This has been a popular pea in England; and grown to some extent in America, tho not found listed here in recent years. It is compared with English Wonder, American Wonder, British Wonder and Stratagem; and with us more like the latter.

Height about $1\frac{1}{2}$ to $1\frac{3}{4}$ feet, very similar to Stratagem in habit, branches and foliage, but with sharper-tipped stipules, having smaller serrations extending farther up the lobes; flowers much lower, 7th node; pods fine green in color, decidedly smaller, $3\frac{3}{8}$ to $3\frac{3}{4}$ inches long, but quite uniform, decidedly wrinkled when ready to pick, not as long rounded at the ends and showing a tip; peas about 6, very large, indented, wide oblong or nearly square, glistening dark green, very good quality; seeds rather smoother and less green than those of Stratagem. The season is fully a week earlier than that of Stratagem, and the crops were good.

Potlatch. Refs. 20-22. Potlatch, an Indian word for "big dinner," was the name applied to a pea said to have come from the Pacific Coast and introduced, probably about 1906, by Leonard. It was pronounced identical with Dwarf Defiance or Improved Stratagem by several who cataloged it; but a leading pea grower, very careful of stock and descriptions, listed both Dwarf Defiance and Potlatch and noted several of the differences that we found in recent tests of them.

Plants of Potlatch 4 to 6 inches or more taller than those of Dwarf Defiance; stem somewhat less angled at the base; foliage more dense but not quite as dark green, with stipules relatively smaller and more wrinkled; flowers at least three nodes higher than Dwarf Defiance; pods are almost half an inch shorter, not as well filled and very long-rounded at the points; peas about one less; both pods and peas better colored. Potlatch, with us, was distinctly later than Dwarf Defiance, and not very productive.

Big Marvel, introduced by the Schultz Seed Store, Washington, D. C., is said by another seedsman, who cataloged it the following year, to be identical with Potlatch; but both speak of it as early, which Potlatch is not.

CHAMPION OF ENGLAND GROUP

The Champion of England group begins with Knight's Marrows, the first named varieties with wrinkled seeds. Wrinkled peas were known before Knight's time, being mentioned by Tragus and Dodoneaus in the middle of the sixteenth century, and Knight used plants producing such seeds in his crosses, but his statements indicate that these were not of any named variety. Some authorities believe the Rouncival peas were wrinkled, but we have nowhere been able to find any definite statement to that effect; and the various Rouncival names have been used as synonyms of different old varieties plainly belonging to the smooth-seeded, or American marrowfat type, or to other groups of round peas, green or blue in color. Connection of Champion of England with the Knight peas has not been definitely established; but as these peas, or immediate descendants of them, were the only wrinkled peas known when Champion originated, the relationship may be assumed, especially as early references place the variety in the group of "Knight's Green" peas.

As all of the Knight peas have passed out of cultivation, except, possibly, Knight Dwarf White Marrow and Knight Tall White Marrow (or Jenny Lind), discussed in the "Cream-seeded Wrinkled" group, only a summary of group characteristics of them will be given, preceding Champion of England, which is described in detail.

Knight Marrows. Refs. 1-10; N. Y. Sta. *Rpt.* 3:247. 1885. The varieties of this group include tall and dwarf (so called) forms of white, green, and blue wrinkled peas, the names and synonyms showing about all possible combinations of the descriptive terms used, prefixed by the name of the originator, Thomas Andrew Knight, Downton Castle, Wiltshire, Eng., one of the most useful plant breeders and students of fruit and vegetable problems of his time. With him started the line of sweet, wrinkled peas which has made that vegetable the leading spring and early summer garden crop of England, and which has resulted in the grand varieties of today. The exact date of origin of the separate varieties is unknown, but probably previous to 1827. All were described in 1834 or 1836, two years before Knight died, and at least one, the Tall Green Marrow, reached America in 1827. As indicated by the names, the varieties were separated by their heights (5 to 7 feet for tall types, 2½ feet or less to 3½ feet or more for dwarfs), and the color of the seeds. All were rather early midseason varieties except the Dwarf Green Wrinkled Marrow, which was ten days to two weeks later than the others.

As grown here in 1884, Knight Tall Green Marrow was 3 to 5 feet tall; stem medium or large, with internodes rarely exceeding 2½ inches; and Knight Dwarf Green Marrow, 1 to 2 feet tall; stem stocky, with internodes usually under 2 inches; both sometimes branched at the base and often above; foliage between light and deep green, slightly washed white, very glaucous in the dwarf type and less so in the taller one; pods usually in pairs, 2 to 3 inches long, blunt at the tips when well filled; peas 4 to 8 (rarely exceeding 5

in the dwarf form), large, whitish green in color, compressed in well-filled pods, sweet and of good flavor; seeds quite large, olive green tinted almost white. High productivity was a merit of all Knight's peas; but the smallness of the pods would prevent classing them as high yielders now.

Champion of England. Refs. 11, 13; *Jour. Hort.* 1:237. 1861; N. Y. Sta. *Rpt.* 3:246. 1884. Champion of England was introduced, through various seedsmen, by Fairbeard, in 1846, after having been grown by him for at least five years. It is said that Champion of England and Fairbeard Surprise came originally from one pod, found in a crop of Knight Dwarf White Marrow. One seed produced a wrinkled and the other a smooth-seeded variety. Another reference states that the stock of Champion was sold, on Sunday morning, for a pot of beer. The variety was brought to the United States in 1849, and in 1901 was the pea most listed in American seedsmen's catalogs; while in 1921, most surprisingly, it was still fifth or sixth in the lists. As grown at this Station in 1884, Champion of England, except for size of pods, differed very little from Knight Tall Green Marrow in characteristics, but was much earlier and was considered much more prolific, and with peas unsurpassed in flavor and sweetness.

In our recent tests Champion of England and Improved Champion of England were grown, both from American seed.

Height of original variety 4 to 5 feet, or in one season 4 to 4½ feet; stem stout, with rather short internodes, branched rather freely both at base and above; foliage abundant to almost dense, rather darker than medium green, with leaflets in 4s, medium in size and non-characteristic in shape, and much larger, deeply clasping stipules, somewhat whitened and slightly glaucous, rounded at the tip and with shallow teeth about half way up the edge; tendrils rather prominent, but slender; flowers medium in size, white, from 14th node on short stem, 17th on tallest ones, single, differing in this respect from the variety as grown 40 years before; pods smooth, light-colored, on long, slender stalks; much longer than those of Knight Marrows, from 3¼ to 3½ inches, rarely 4 inches, medium in width, not very plump, straight or very slightly curved, fairly well filled, rounded to blunt at the ends, and without distinct tips; peas 5 to 7, of medium size, smooth, round, oval, not crowded in the pods, and light green in color, of excellent quality, sweet, moderately thin-skinned, and tender; seeds large, broadly oval, thick and occasionally indented, faintly bluish cream to light green in color, and well wrinkled.

The crops were good, beginning in late midseason, 71 days from May 11, or 68 from May 22, and ripening slowly. In England, before the variety was introduced, pods were ready to pick on June 2, the earliest date for any wrinkled pea up to that time.

The Improved Champion of England, as compared with the old type:

Stems slenderer, less branched; foliage rather lighter colored with smaller leaflets often in 6s, decidedly smaller stipules longer and narrower, with sharp tips and sharper teeth; pods shorter, plumper, blunt-ended, deeper green; peas averaging fewer, smaller, often much compressed, and of better color; seeds decidedly smaller, with more green color and better wrinkled.

The Improved strain was not as early as the original and did not yield as well, especially when the smaller

size of the pods is considered; but the peas were probably even better in quality tho no definite comparison was made between the two strains.

Napoleon. Refs. 27; Hovey *Cat.* 1859; Hogg *Gard. Yr. Bk.* 14:107. 1873. Napoleon, Climax, and Fairhead Excelsior are regarded as identical, but were probably of independent, tho nearly simultaneous, origin by selection from Knight Dwarf Green Wrinkled Marrow. Hogg gives Napoleon only as a synonym of Climax.

Napoleon and Eugenie, a similar but white-seeded variety, said to have originated from seeds in the same pod, were raised by Harrison, and announced in 1856 as superior to Unique and Masterpiece, varieties previously distributed by him. Napoleon was brought to America in 1859 and said to be much earlier than Champion of England, and a great bearer. It was about 3 feet tall.

Climax. Refs. 27; Hogg *Gard. Yr. Bk.* 14:107. 1873. Later in the same year, and in the same periodical in which Napoleon was announced, Climax and Alliance, a white wrinkled pea, were advertised as superior to Perfection and Glory, Harrison's dimpled peas sold the previous year. As no connection of Climax with Napoleon is here mentioned, it is probable that these two peas, with the similar white seeded varieties, Alliance and Eugenie, and their predecessors, Unique and Masterpiece, as well as the dimpled peas, Perfection and Glory, were all selections from the Knight peas, made within a year or two.

Climax reached America in 1861, both it and

Napoleon being listed by the same firm and evidently regarded as distinct, Climax being smaller than Napoleon, and early. Hogg condemns Climax because of its poorly filled pods, many peas aborting.

Forty Fold. Refs. 29; *Ann. Hort.* 124. 1889. Forty Fold, or Forty Fold Champion, originated with Fairbeard, about 1864. Several American seedsmen listed it between 1889 and 1907 and it was still cataloged by more than dozen firms in 1901. It was a selection from Champion of England and an improvement on that variety.

Shorter in stem, with larger pods, longer and considerably curved, almost scimitar shaped, and better filled; peas of poor color, of medium size, oval, sweet, juicy and well flavored; seeds light green and very well wrinkled. The variety was late like Champion of England, but more prolific and held freshness better.

Free Bearer (Ref. 34) is a comparatively new pea of the old Champion of England type, which originated with Kelway before 1922. It was grown at the Idaho Station, from which seed was secured for a test at this Station. It is probably not known commercially in the United States.

It proved to be dwarf, 2½ feet tall, with only a few basal branches; foliage abundant dark green, frequently with 6 leaflets as in Improved Champion; flowers very free from the 14th node; pods rarely paired, 3 to 3½ inches long, rather narrow but very plump, very slightly curved, well filled, with rounded to blunt ends and often with rather large tips; peas very uniform in the pods, smooth, round or slightly indented, oval, medium in size and color; seeds very small, 170 to the ounce, much flattened, often almost cylindrical, well wrinkled and light green, greenish or bluish cream and cream in color. The season was the same as that of Champion; and crop very good.

NE PLUS ULTRA GROUP

This old group is another with indefinite limits. The crossing of types which has lead to the introduction of most wrinkled pea varieties has grouped characteristics in very diverse combinations; parents outside a group may have progeny which can be classed in the group only, if the leading group characteristics are considered; or parents, both unmistakably showing group characters, fail to transmit these but carry recessive factors that place some descendant in a group of entirely different types.

The variety Ne Plus Ultra is not, and never has been, very widely known in America; and may not bring to mind as clear a picture to represent its group as Senator, Little Gem, or Telephone do of theirs; but, unfortunately, few other varieties of the group are much better known here, peas of the type or types here collected not being very popular or very successful in America, tho filling an important place in English and European pea culture. Thos. Laxton is probably the best known member of the group; but this is a comparatively recent addition and rather short-stemmed to be typical. Ne Plus Ultra is more than 80 years old; but is still listed and grown in England; and an improved type of it is becoming prominent in Sweden. The varieties of the group, within wide limits in many directions, have tall stems, round and slender at the base, enlarged and angular above, with long internodes, occa-

sional medial branches, and abundant, light green foliage; pods single or paired, from about the middle of the stem on long, slender stalks, medium to fairly large, broad, hardly plump, straight or slightly curved, with rounded to blunt, or rarely square ends, with small tips; peas 3 to 7, large, rather oblong, of fine quality; seeds medium sized, finely wrinkled, cream, greenish cream or light green. The Ne Plus Ultra varieties are essentially blunt-ended, plump-podded correlatives of members of the Telephone group.

The type variety, Ne Plus Ultra, was preceded by one of somewhat similar type, the old Magnum Bonum, which is first discussed. The history and characters, in considerable detail, of Ne Plus Ultra are next given; after which the other varieties of the group are described by those characters which connect them with the type variety or separate them from it.

Magnum Bonum. Refs. 1, 2; Hogg *Gard. Yr. Bk.* 14:103. 1873. The name Magnum Bonum is very old in English pea literature, but references ally it so closely with Ne Plus Ultra that it may be only the name for a portion of the old stock of peas of this type grown without name for many years at Berkhempsstead. Hogg says Ne Plus Ultra was selected from that stock by Brownlees after it had been locally known for many years. Hogg does not mention Magnum Bonum, but gives Cullingford's Champion as a synonym of Ne Plus

Ultra; and others say Magnum Bonum was Cullingford's; so the three names may apply to one pea. The two varieties are, at least, very similar; and the descriptions given do not permit separation. Sutton's and Ambler's Magnum Bonums of later date were quite different; but are probably the varieties grown in America under the name.

Ne Plus Ultra. Refs. 4-11; Burr *Fld. Gard. Veg.* 544. 1863; Hogg *Gard. Yr. Bk.* 14:103. 1873. The origin of Ne Plus Ultra is unknown; but Thos. Andrew Knight's name is associated with it in one advertisement; Knight's Albert Edward is given as a synonym, and the variety is said to be "very close to Knight Dwarf Green Marrow." It was apparently first advertised by Brownlees in 1845, and a later reference says it was introduced under several names in successive seasons between 1837 and 1847. Gen. Wyndham is generally given as a synonym of Ne Plus Ultra but Hogg says it was produced from that variety tho a much more vigorous grower, with much larger pods and a longer season. In America Ne Plus Ultra was described by Burr in 1863, listed in the United States Patent Office Report for 1865, noticed in a rural publication in 1870, tested by the United States Department of Agriculture in 1904, and grown by one of the leading seed-pea firms in 1907. It was not grown at the Station during its early years but was included here for the World's Fair display in 1893, when found tall, vigorous, of good quality, late. It was not found listed in America during our recent trials but seed of it was sent here from British Columbia and from Idaho.

In England Ne Plus Ultra grows very tall, sometimes 7½ feet, but here it seldom exceeded 4½ feet; stems slender, round at the base but enlarged and angular above, with long internodes and moderately prominent nodes, occasionally branched below the flowering node, 10th; foliage abundant, light green, almost bloomless and little whitened, with non-characteristic leaflets in 4s and 5s, and much larger, round-tipped stipules with shallow teeth at the base, and clasping the stem deeply; pods single or in pairs on long slender stalks, 3 to 3¾ inches long, occasionally 3¾, with long sepals, broad, only moderately plump, oval to flat in cross section, straight, almost blunt at the ends or rarely square, with small recurved tips, smooth or slightly wrinkled when ready to pick, good dark green in color, with heavy bloom giving a grayish cast, holding freshness well; peas 3 to 7, large, oval to long-oblong usually separated in the pod, smooth coated, dark green in color and of splendid quality; Idaho seeds were much smaller than those from British Columbia and all cream colored, the other being one-third green. These differences practically disappeared in the crop seeds of the two strains. The variety is not ready until past midseason, requiring 9 weeks from very late sowing to more than 10 for earlier ones. The crops in different years ranged from fair to very good.

Quality rather than productivity is the commonly noted merit of Ne Plus Ultra.

Non Plus Ultra, an improved strain, was grown here from seed sent by the Swedish improver, and is quite different in many ways:

Dwarfer, heavier stemmed, with shorter internodes, often with two stems from base and branches from mid-stem, with small leaflets in 4s, and lightly clasping stipules, both much darker in color but with heavy bloom; pods slightly shorter, usually quite uniform, but occasionally only 2¾ inches long, narrow, plump and square-ended or even protuberant, more like those of some of the

Gems than like the old Ne Plus Ultra. Peas 7, very large, not of as good color as in the original variety, but of excellent quality. The season was a little earlier and the crop better.

Carter has recently reintroduced, or improved, Ne Plus Ultra and the variety was "highly commended" in Royal Horticultural Society tests.

Conqueror. Refs. 12, 13; *Rural N. Y.* 47:113. 1888. Conqueror is said to have originated with Payne, of Gayton, Eng., who found it as a sport in a field of Knight Tall Green Marrow. Part of the stock was sold to the Messrs. Jeyes of Northampton, who sent it out as Jeyes Conqueror. Both this name and Payne Conqueror are given as synonyms of Ne Plus Ultra, but the two varieties are distinct, originating at different times, one from Knight Tall Green Marrow and the other probably from Knight Dwarf Green Marrow. Conqueror was more vigorous, had larger pods, and filled better than the original Ne Plus Ultra. As Payne Conqueror, this pea was grown here in 1888 and differed from the current and recent descriptions of Ne Plus Ultra, having pods often paired, borne high on the stems, on short, curved stalks and containing flattened seeds. It was productive, but too tall and too late to be considered valuable.

Ritchie Conqueror, grown here recently from seeds received from British Columbia, is only 3½ feet tall, has stout, unbranched stems, rather scanty foliage with larger leaflets and stipules which are more whitened but less glaucous than those of Ne Plus Ultra, flowers high and has more pointed pods, hardly of this type, with similar peas and even larger seeds. It was fully as late, and unproductive.

Veitch Perfection. Refs. 15-19; Evans *Cat.* 1868. Were Veitch Perfection, as grown in America, more true to the Ne Plus Ultra type, its name might well be applied to this group, as it has been more widely grown than the type variety; but it differs from Ne Plus Ultra and others of the group in many points. It is included by relationship, rather than by resemblance.

The variety originated with Veitch (1) before 1857, probably as a selection from Hairs Dwarf Mammoth; and after 70 years is still extensively grown in England. It came to America about 10 years after its introduction, was listed by several firms as lately as 1901, and, as Perfection, is probably still grown by Pacific Coast seed firms. It was very popular in the Northwest.

It was grown at the Station in 1884, but was not found, at least not under the full name, in 1921 or 1922 American catalogs. In the old tests:

Height 3½ to 4 feet, with strong stem, much branched at base and often above, with internodes of medium length; foliage ample, deep green, only slightly whitened and slightly glaucous on stipules; pods shorter than those of Ne Plus Ultra (not so in England), 2½-3 inches, often paired, straight, broad, "tapering gradually to apex" (others say blunt-ended), medium green (others say "good" or "dark" green): peas 5 to 6, large, flattened, whitish green; seeds large, much flattened and wrinkled, dull, pale green and bluish white. The variety was late, tho earlier than Ne Plus Ultra, matured pods slowly and was "extremely prolific."

It was considered in England the finest pea of the Knight Green Marrow class.

G. F. Wilson. Refs. 22; *Gard. Mo.* 15:357. 1873. Carter sent G. F. Wilson, probably unnamed, to the Royal Horticultural Society for testing in 1872; the committee on awards gave it a First Class Certificate, and named it for the President of the Society.

It was considered as great an improvement over Ne Plus Ultra as the latter was over Hairs Dwarf Mammoth. Tho considerably grown in England, France and America, which it reached in 1873, it was never as well known as the older variety. It was grown at the Station in 1884 and again in our recent tests from English seeds, and was also studied and described in the U. S. Department of Agriculture plat at McMillan, Mich. The three descriptions correspond very closely; but pods were better in the later tests than in the older ones, and better at McMillan than at Geneva.

Height 2 to 3 feet, with very stout, angular stems, short internodes, and numerous heavy medial branches; foliage abundant to dense, dark green, large leaflets in 6s, noticeably notched or serrate toward the tips, and exceedingly large stipules, much whitened and glaucous. In the old tests whitening and bloom almost completely absent, but in the recent ones, at McMillan in particular, the foliage showed a distinct bluish cast, from the abundant bloom. The very large flowers, white with deep green shading at base, begin at the 14th or 15th node, on short stocky peduncles, are often paired (in old test and at McMillan, not in recent Station test); pods singly or paired, 2 to 3 inches long in 1884, $3\frac{1}{4}$ to $3\frac{3}{4}$ inches long at Station in 1924 and 1925, and $4\frac{1}{4}$ to $4\frac{1}{2}$ inches long at McMillan in 1925, broad, quite plump, straight or very slightly curved, rounded or blunt at the ends, (rather long-rounded in England), with small, recurved tips, deep green in color, and usually well filled; peas 4 to 7, large, slightly compressed, oval to oblong, medium to dark green. Seeds in the old test mostly cream with some pale bluish green, but in recent tests the green seeds largely predominated. All were large, indented, compressed or flattened, but only moderately wrinkled.

G. F. Wilson in England was nearly a week earlier than Ne Plus Ultra but in America it is as late and no more productive.

Latest of All. Refs. 29; *Rural N. Y.* 42:637. 1883. Latest of All was introduced about 1882 by Sutton. It is said to have been selected by Mayer from McLean's Premier. It has been grown in America from about two years after its introduction up to the present, but never widely.

Height medium, 2 to 3 feet; stems very stout, with a few branches well distributed from base to tip; foliage dark green with bluish tint from heavy bloom, with medium sized leaflets, round at base of stem and very broad toward top, much larger, rather narrow stipules; pods from 15th or 16th node, often paired, 3 to 4 inches long, nearly straight, wide, plump or even inflated, blunt ended when well filled. As the name indicates, the variety is very late, and being only slightly affected by mildew may bear until frost. It is said to be better than Perpetual Bearer, which was introduced about the same time, and the latter is said to be better than Bliss Everbearing, which, however, falls in another group.

Autocrat. Refs. 36; *Noll Cat.* 1907. Autocrat was raised by Jas. Veitch before 1885, when it received a First Class Certificate from the Royal Horticultural Society. It also received an Award of Merit from this Society in 1922, when samples were sent for trial by nine different growers. It appears to have been first advertised for sale in 1888, soon took rank as the best very late pea; and still stands high on the list. Late

peas are not so popular in America, where mildew and other diseases interfere with their success, and, altho Autocrat is said to be resistant to mildew, it was not brought to the United States for 20 years, coming in 1907, and has been listed by few seedsmen. Two strains were grown in our recent tests, one from British Columbia and one from England. The British Columbia strain did not mature satisfactorily when sown May 22, but gave a pod or two in 12 weeks.

Plants taller, $3\frac{1}{2}$ feet, than those from English seed, grown in a dryer season, $2\frac{1}{2}$ feet; but otherwise appeared the same, of Ne Plus Ultra type but good dark green in color. Pods from the English seed, sown May 11, were ready in 86 days, were borne singly, above the strong, medial branches, on long, heavy stalks. The internodes separating the flower-bearing joints elongated rapidly as the buds formed, while those below remained short, thus changing what appeared like dwarf plants in early season to medium height or tall ones as the pods matured. The pods were generally $3\frac{1}{2}$ to $4\frac{1}{4}$ inches long, occasionally only 3 inches, broad, almost plump, with a tendency to wrinkle, very slightly curved, not very well filled, with ends varying from long rounded to almost blunt; peas 4 to 6, of Ne Plus Ultra type, dark green and oblong or broadly oval, flattened or indented; seeds like those of Ne Plus Ultra but with considerably more green.

Juno. Refs. 43; *Ann. Hort.* 132. 1893. Juno originated with Eckford, and was introduced in 1890, coming to the United States in about three years; being grown at the Station in 1893 (Bul. 69) for display at the World's Fair, yielding very well. It has been quite popular in both countries, and is still listed by a dozen or more American seedsmen. By some it is held identical with Dwarf Champion; but was undoubtedly of distinct origin.

Two strains grown here, from Idaho and British Columbia seeds, differed decidedly in size, color and amount of wrinkling of the seeds sown, and to some extent in length of pods produced; but the seed differences largely disappeared in the harvested samples and other differences were lessened in plants of the second season. It is a good dwarf Ne Plus Ultra, $2\frac{1}{4}$ to $2\frac{1}{2}$ feet tall, more branched, with darker foliage, otherwise similar, podding a node lower, with very similar pods rather better filled with more and smaller peas, but in the early Station test these were not considered of high quality.

It was very much like Ne Plus Ultra in season and crops. Its classification status is like that of Thomas Laxton, below.

Thomas Laxton. Refs. 52; *Dreer Cat.* 1902. Thomas Laxton originated with the noted horticulturist and pea breeder of that name, was introduced in 1898 and reached the United States in 1900. It was said to be a Gradus x Earliest of All cross; but was in many respects a Ne Plus Ultra type pea, as the pods are blunt or occasionally almost square at the ends, tho usually, in the United States at least, somewhat shorter than well-grown ones of the type variety. Thomas Laxton is also much earlier in season and shorter in stem than most others of the group. It might almost equally well be included in the blunt-podded section of large-podded Dwarf peas.

In England Laxton is reported as growing, in various localities and years, from 3 to 5 feet tall, but usually about 3 feet; while in America the limits found have been $1\frac{1}{2}$ to $3\frac{1}{2}$ feet. In Station tests it was from $2\frac{3}{4}$ to 3 feet tall; stems moderately stout, un-

branched or with an occasional basal branch; foliage only moderately abundant, medium green, of fairly large leaflets of regular shape, in 4s, slightly whitened, and almost bloomless, and stipules slightly larger than the leaflets, more whitened and with some bloom; flowers at 8th or 9th node; pods single, on long stalks neither slender nor stocky; quite even, ranging from slightly above to slightly below 3 inches, with exceptional ones somewhat above or considerably below the average, moderately broad only, but very plump, straight, well filled, blunt to square at the ends, with small, straight tips; peas average 5, very large, tend to wrinkle when still tender, seldom indented and between oval and oblong in vertical section; both pods and peas medium green in color, rather darker than those of Gradus; peas medium sized to rather large, mixed cream and green in color and well wrinkled. Its season is about that of Gradus, some finding it a day or two earlier, others a few days later than that variety. It is usually decidedly more productive.

King Edward (Ref. 58), which is distinct from King Edward VII and Edward VII, was introduced in 1907 by Sutton and has been grown in the United States Department of Agriculture tests, and at the University of British Columbia, the source of the seeds used in our recent tests.

It is a dwarf Ne Plus Ultra, 3 feet tall; with foliage rather more abundant and much darker, with leaflets sometimes notched, or "stepped," near the tips; blossoming much higher up on the stem, 15th node; pods very large, $3\frac{1}{2}$ to $4\frac{1}{2}$ inches long, broad, only moderately plump and often deceptive, enlarging before the peas are of edible size, usually rather long rounded but occasionally almost blunt, as in English descriptions, light in color, smooth and pleasing in appearance; peas 6 to 8, large, smooth, oval oblong, whitish green. The season is about that of Ne Plus Ultra; and the crops under Station conditions were only fair to good; tho in England it is recommended as one of the most productive peas.

Snowdrop (Refs. 56, 57) was introduced by Carter before 1908, in which year it received an Award of Merit from the Royal Horticultural Society. It is said to be a cross between Early Morn and Express, the combination resulting in a second early pea of Ne Plus Ultra type. Snowdrop was listed in Carter's American catalogs, and undoubtedly was grown here to a limited extent; while the Early Snowdrop of the second reference is probably the same; as Snowdrop, in our tests was among the earliest of the Ne Plus Ultra group, pods being ready in 56 days from plantings of May 11. It was very similar to Thos. Laxton with which Early Snowdrop is also compared. The leaflets and stipules of Snowdrop were smaller than those of Thos. Laxton and lighter in color, but the pods and peas were of better color, the latter being dark gray-green. The crops were about the same, good to very good.

Routledge Prize (Ref. 62) originated in New Zealand and was brought to America in 1918 by Routledge. As grown here:

Rather short-stemmed ($2\frac{1}{2}$ to 3 feet), unbranched, foliage almost scanty, medium green, of large broad leaflets and much larger, deeply clasping stipules, both decidedly whitened; flowers single, white, from 16th node; pods on stocky stalks of medium length, fully half an inch longer than those of Ne Plus Ultra ($3\frac{1}{2}$ to $4\frac{1}{8}$ inches), very plump, and without distinct tips, but otherwise of the same shape and similar in color; peas 8 or 9, very large, indented, oblong, medium green in color and of very good quality; seeds almost indistinguishable from those of Thos. Laxton, but with a bluish shade overspreading the cream color and modifying the green. Routledge Prize was a few days earlier than Ne Plus Ultra and one of the best croppers of the group.

Sutton Alliance (Ref. 63) was introduced by Sutton in 1920; and has been grown at this Station from the originator's and Idaho Station seed.

Plants rather dwarf, $2\frac{1}{4}$ to $2\frac{1}{2}$ feet, of Ne Plus Ultra type, sparingly branched and with abundant dark, bluish green foliage; pods smooth, $3\frac{1}{2}$ to $4\frac{1}{8}$ inches long, broader than those of Ne Plus Ultra, often enlarged at the tips and with rounded to blunt ends and short, wide tips, attractive medium green, not filling well under our conditions, usually showing many abortive peas; peas 3 to 7 or more, exceedingly large, very smooth-surfaced, round-oval or oblong in shape and not compressed or indented, dark green; seeds very large, mixed cream and green as sown but nearly all green as harvested, and almost dimpled or coarsely wrinkled. The crop was as late or later than that of Ne Plus Ultra, and only fair under our conditions, as the pods were never paired, tho said to be more often paired than single in England.

Another Alliance is described in the Wrinkled, Cream-seeded group.

Liberty (Ref. 64) was introduced by Sharpe about 1921; and has probably not been grown in the United States except at the Idaho Station, here, and on United States Department of Agriculture plats. The plants are hardly of Ne Plus Ultra type:

Height under 3 feet; stems stout, usually with basal branches; foliage dense, very dark blue green, not whitened, with non-characteristic leaflets in 6s and much larger, deeply clasping, sharp-tipped, stipules, finely serrate to above the middle; pods start at the 15th node, on long very heavy stalks, singly or in pairs, the longest of any described for the Ne Plus Ultra group, usually $4\frac{1}{4}$ to $4\frac{1}{2}$ inches, occasionally only $3\frac{3}{4}$ or almost 5 inches, tending to curve slightly, but otherwise of Ne Plus Ultra type, very dark in color with heavy bloom; peas 5 to 7 or more, also very dark green, smooth, round and not indented, oval in vertical section and smaller than most of those in the group; seeds of medium size, dimpled to coarsely wrinkled, largely cream in color. Liberty was in season with Ne Plus Ultra, pods ready in about 10 weeks from sowing May 10; and gave a good yield.

TELEPHONE GROUP

Probably no other group of modern peas consists of so many varieties so similar in type as that based on Telephone. Little "ancient history" of the group can be given, since Telephone itself is a selection, only, from a cross-bred pea, Telegraph, neither of whose reputed parents resembles Telephone; therefore it would be without significance to follow either line back.

Sutton's Goliah, or Goliath, may have been a Telephone-like pea, as is the pea so named much later grown in America. If so, it is probably the oldest of the group.

Laxton Superlative, a variety a few years older than Telephone, appears to be the first one very similar to it, tho of entirely different breeding. It undoubtedly entered, directly or indirectly, into the make-up of several of the succeeding large-podded additions to the Telephone group. In the following discussion of varieties, Superlative is first described, briefly, by comparison with Telephone. The latter variety so closely corresponds to most of the other varieties in the group that it, alone, is described in detail, the others being connected with this fundamental description by similarities, or

separated from it by differences. The resemblance of the varieties in this group starts with the seeds, which in practically all are large, well wrinkled and cream and green in color. In an examination of the 1928 crops on the Arlington Farm plats of the U. S. Department of Agriculture, using five pods selected as typical from each of about 15 varieties of this group, Col. C. B. Sayre of this Station and the senior author could find no constant separatory differences. The pods so varied in the variety or were so much alike in different varieties, in shape, size and color, that it would have been impossible to distinguish one variety from another by these selected pods; and it would have been very easy to have chosen from a considerable quantity of the pods of any variety, similar groups of five pods showing as great differences. The various differences were much less than strain differences in many well-known varieties in other groups. In our tests, in a few cases, as with *Amateur Pride* and *The V. C.*, the seeds sown were all cream colored without trace of green, but the harvested seeds were either all light green or mingled cream and green. It is possible that a few varieties, like *Gradus*, now placed in the Wrinkled, Cream-seeded group, might be placed in the Telephone group, but usually any large podded peas placed in the cream-seeded group differed from Telephone in other characters than seed.

Laxton Superlative. Refs. 1; *Gard. Chron.* 1199. 1872; *Roy. Hort. Soc. Jour.* 12:35. 1890; *Rural N. Y.* 31:365. 1872; *Hogg Gard. Yr. Bk.* 14:85. 1873; *Thorburn Cat.* 1873; *N. Y. Sta. Rpt.* 3:244. 1885. Superlative originated prior to 1871 with Laxton, and was advertised for sale in that year by Hurst. Early references to it say it was the result of a double cross between *Ne Plus Ultra* and an unnamed pea whose parents were *Laxton Supreme* and a second unnamed sort. This may have been *Tall White Sugar*, since Laxton said, later, that Superlative had in it the "blood" of a tall sugar pea, which gave it its large and too often "puffy" and poorly filled pods, but which made it useful in breeding new varieties for pod size. Superlative was later handled by other English seed firms, was noticed by an American periodical in 1871, and was introduced here in the next year—very prompt action, induced undoubtedly by the remarkable size of Superlative's pods, which, in England, were sometimes 7 inches long.

It was grown at this Station in 1884, as was Telephone, from the records of which tests the following points of difference from Telephone are taken, characters for Superlative being given first:

Height 3 to 5 feet, 3 to 4 feet; rarely branched, sometimes branched; stalks 1 to 2½ inches long, 1 to 4 inches; pods single, often paired; pod length often 4 inches, 3 to 4 inches; pods very plump or inflated, pods sometimes slightly inflated; peas 5 to 8, 4 to 9; seeds mostly cream colored, seeds varying from almost white to pale green; seeds roundish and scarcely indented, shriveled and indented; seeds 80 per ounce, 87; not prolific, prolific; rather late, Hogg says the foliage was large, broad, pale, pods 4 to 5 inches long, irregular in outline, much curved, pointed, often poorly filled.

Laxton Superlative has probably not been grown

in either England or America during the present century, so cannot be confused with *Sutton Superlative*, introduced in 1906, tho both come in the Telephone group.

Telephone. Refs. 2-9; *Rural N. Y.* 40:272. 1881. Telephone was a sport from *Telegraph* or resulted from an accidental cross in it, and was selected from that variety about 1878 by Carter. It soon became very widely distributed in England; and after 1881, in America. *Telegraph* had as its parents *Veitch Perfection* and *Laxton Prolific Long-pod*, one having wrinkled, the other dimpled peas. *Telegraph* followed *Laxton Prolific* and produced dimpled peas; but must have had, as a recessive character, the wrinkling shown by *Veitch Perfection*, which reappeared in Telephone. Both *Telegraph* and Telephone showed marked increase in pod size, probably due to the added vigor so often noted in cross-bred seedlings. However induced, both peas had the long, broad pods characteristic of so many modern peas which had previously been shown, in the type with pointed or long-rounded ends, only by *Laxton Superlative* or some of the edible-pod peas, with which neither *Telegraph* nor Telephone have any apparent connection. Telephone was not well fixed in character when first disseminated, showing great variations in color of foliage and of pods, some of the selected strains from it being continued under the same name, with or without qualifying adjectives, others receiving new names, thus giving a very intricate synonymy. This diversity of strains makes it impossible to say definitely what characters or what degrees of slightly variant characters marked the first Telephone; but it is certain that it was lighter in color, both of foliage and pod, than most of the strains now sold under the name of Telephone. Some of the characters of an early strain are noted in the comparison between this variety and *Laxton Superlative*. Several strains have been grown in our recent tests; and from these, particularly from the lightest colored strain, the following quite detailed description is given:

Seed quite uniform in general appearance, much wrinkled, oval to oblong across the pod axis, indented along the axis, some being almost cylindrical, quite large (104 to the ounce), greenish cream and light yellowish green in color, over greenish yellow cotyledons, with radicles obscure; plants 4½ to 5 feet tall, trailing so that support is necessary, of vigorous growth; stems moderately stout, rather coarse, angular, quite smooth on the surface, with long internodes, rarely branched, but occasionally showing a few slender basal branches; foliage abundant, medium green in color, with little bloom on leaflets but some on stipules; leaflets usually 4, rarely 6, large to medium in size, broad; stipules deeply clasping stem, slightly larger than the leaflets, with sharp tips and teeth half way to the tip, of same basal color as leaflets but much more whitened; tendrils not characteristic; flowers begin about the 12th node, almost always single, not characteristic; pods single, on long, slender stalks, with large to medium-sized receptacles and straight, not characteristic sepals, 3¼ to 4½ inches long, mostly between 3½ to 4¼ inches, moderately broad, plump, somewhat wrinkled when ready for picking; straight, with long, almost parallel sides, without constrictions between the peas, usually well filled to the edge but not well filled to the pointed or long-rounded ends, which sometimes show also a dorsal slope toward the point, same in color or lighter than the foliage, hardly medium green; peas 7 to 9, very



A Stratagem-type pea

DWARF DEFIANCE

(Two-thirds natural size)



GIANT SUGAR

Nearly natural size

large, round oval, smooth surfaced, medium green, of very good, but not quite best quality. When sown on May 11th the first Telephone pods were ready to pick in 65 days, earlier sowings requiring about a week longer and later sowings, which brought ripening into hot weather, needed 10 days less. In no case were our crops better than "good," an average yield for peas of this type; but different strains varied somewhat in yield. Improved Telephone and Improved Dark-podded Telephone differed from the name-strains in slightly more uniform and darker colored pods and better colored peas.

Tall Telephone (seed from British Columbia) proved true to the name, the stems being 6 feet long; but the pods began much higher on the vine (21st node), were much smaller, more like those of Advancer, and were nearly a week later in maturing. The Tall Telephone of Aggeler & Musser is apparently only Telephone, in distinction from Dwarf Telephone, which they also list.

Duke of Albany. Refs. 14-17; *Rural N. Y.* 43:544. 1884. Duke of Albany traces, as does Telephone, to Telegraph, being the result of a cross between that variety and Hallamshire Hero (unknown in America), made before 1882 by Abbott. It soon gained a prominent place in England, reached the United States in two years and became well known under its own name or that of America Champion; and it also met some favor in France. It is still known in all three countries, but is being superseded by other varieties that are more productive. It received an Award of Merit from the Royal Horticultural Society in 1901 and 1916 but was not given one in 1921.

As grown here it is exceedingly like Telephone, but rather shorter-stemmed; the pods average larger and are much more uniform; and the peas and seeds are very large, the latter running 84 to the ounce which number measures 44.5 cubic centimeters as compared with 104 to the ounce measuring 41 cubic centimeters for Telephone. Both pods and peas are slightly better colored than the ordinary, or old, Telephone. The season is the same and the yield no better, if as good.

Admiral Dewey. Refs. 19; *Gregory Cat.* 1904. Admiral Dewey originated with Allan, who had two or three vines of it in 1884, the original plant, according to Gregory, a friend of Allan, having been found as a chance seedling among a lot of peas received from England. The marked resemblance of the pea to Telephone would indicate that this find was a variant specimen of that variety from which a strain was developed very free from sports, rather shorter-stemmed than Telephone, and with longer and greener pods and greener peas and seeds.

In our tests Admiral Dewey (not from the originator's seed) appears to have degenerated to some extent, being taller than when introduced (5½ feet) and taller than Telephone, and with shorter, rather than longer pods, and pods and peas of the same or lighter color. The stem was more branched than that of Telephone, having occasional long medial branches, and the pods were sometimes in pairs making Admiral Dewey decidedly the better cropper of the two.

Victory. Refs. 20-22; *Landreth Cat.* 1897; letter from J. Bolgiano Seed Co., Jan. 27, 1927. Sharpe Victory received a First Class Certificate from the Royal Horticultural Society in 1886, which was probably shortly before its introduction. It apparently was slow in coming to America, our first reference to it being 10

years later but it was considerably grown for a time. One reference says it was of the Shropshire Hero class, but earlier and better sources speak of pods whose size and shape ally the variety with Telephone, although much shorter and stouter in stem and with many branches. The pods were evidently fully as long and as broad as those of Telephone, and long-rounded ends, and were bright green. It was a late midseason pea.

In 1918, Hurst sent to the Royal Horticultural Society for testing a Victory pea, quite different from Sharpe Victory, and corresponding much more closely with Telephone in vine and pod. Hurst does not list a Victory in his catalogs of 1919 or more recent ones nor have we found any other English reference to a Victory of this type.

In 1920, J. Bolgiano announced as a new creation a pea bearing this name, which came from a few vines found among the crops of one of the late tall-growing varieties of English origin. As grown here, this corresponds almost perfectly to the Victory first noted; altho said to have no connection with that variety.

It is rather later than Telephone, with slightly shorter stems and decidedly shorter joints, more often branched, pods begin higher on stem (17th node), are nearly half an inch longer than those of Telephone and more uniform, often slightly curved at the points, with thicker walls and rougher surface, rounded rather than pointed ends, rather better in color and with peas decidedly greener. The crops varied somewhat but in the last season of testing the yield was much better than that of Telephone.

Alderman. Refs. 29-32; *Burpee Cat.* 1901. Alderman was introduced by Laxton about 1891, and is probably a selection from Duke of Albany, with more branched plants, larger and better colored, and better filled pods and greener peas. It was introduced to the United States by Burpee before 1901, and is still listed by several seedsmen. As grown here, it was better than Telephone, excelling it in the points mentioned above, and yielded much better than Duke of Albany, although the pods of the strain we grew were no larger. Pods and peas were both decidedly darker in color.

Duke of York. Refs. 35, 36. *Cooper-Taber* introduced Duke of York in 1892. It is probably a selection, without crossing, from Duke of Albany. It received a First Class Certificate from the Royal Horticultural Society in 1892 and an Award of Merit in 1893, but was not considered worthy of an award when shown in 1918. It reached the United States about 5 years after its introduction and was listed by several seedsmen, but did not win a permanent place, as it was not found in 1922 catalogs and so was not grown here.

It was said to be about a week earlier and much dwarfer than Telephone, 2½-4 feet, flowered from 14th node and above, with pods much like those of Telephone, no better in color but with peas of higher quality. It was said, in England, not to run to small pods or to suffer from drouth as did Telephone and Duke of Albany; but by at least one large grower in America was found to sport badly.

It is apparently repeated, with some improved characteristics, in Admiral Beatty.

Boston Unrivalled. Refs. 44; *S. Dak. Sta. Bul.* 85:4. 1900; *Burpee Cat.* 1904. This pea was named

from Boston, Eng., the home of John, who introduced it in 1895. It was tested by the South Dakota Station in 1903, for the U. S. Department of Agriculture, and was commercially listed in 1904. It seems to have competed with Duke of Albany in both England and America, the earlier pea probably showing some signs of deterioration which were lacking in the new strain. It received very commendatory notice from the Royal Horticultural Society. It was considered almost inseparable from Duke of Albany in its early days and as grown here recently appears to differ from it only in slightly shorter, less uniform, slenderer pods and smaller peas and seeds. It was not as well colored as Duke of Albany, in either pods or peas, but was, possibly, a little better in yield. Except for its rather slenderer pods it could pass anywhere as Telephone.

Prodigious (Refs. 58, 59) apparently originated with Cooper-Taber, being introduced by them as Prince Edward in 1901 after some preliminary exhibiting at English shows, and simultaneously in America under the name Prodigious by Maule.

It was grown at this Station under both names, and the two strains seemed to differ in height of vines, Prodigious being several inches shorter, but flowering a node higher. These differences, however, were no more marked than pod, pea, seed and vine variations between the three strains of Prince Edward grown from seed from the University of British Columbia and two American seedsmen. The evidence does not overthrow the claim that the Prodigious and Prince Edward were identical when introduced; but merely confirms the conclusion that any variety of peas grown by different seedsmen, both making careful selection but with different ideals, will soon differ decidedly, both from each other and from the original stock grown without selection or roguing.

Averaging the characteristics and measurements of the three strains of Prince Edward and one of Prodigious it would seem that the double-named variety is much like Telephone, or perhaps more like Alderman, but with shorter pods, not longer, which are borne on more rigid stalks than those of either variety. The

season is the same, and the Prodigious strain gave better crops, the others no better than Telephone.

Quite Content. Refs. 66, 67; Burpee *Cat.* 1910. Quite Content, when introduced by Carter in 1906 was undoubtedly the largest podded pea in existence; and the name bespeaks the introducers' satisfaction with their achievement. The variety came from an Alderman x Edwin Becket cross, and is similar in most respects to Alderman, but with much longer pods, parallel-sided, fully as broad and plump, but from their greater length appearing more slender. It was brought to America in 1910 and quite widely distributed; but like so many English peas of exhibition type, has generally proved disappointing. Grown at the Station, from the American introducer's seeds, it has been no better than Telephone.

V. C. Refs. 86; Marshall *Cat.* 1918. Like Quite Content, of which it is an improvement, V. C. was introduced in 1916 by Sutton as "the largest podded pea in commerce." It reached America very soon, being listed in 1918, but has been disappointing, like most English peas of the extremely large-podded type. As grown at the Station, from the English introducers' seed, its pods occasionally reached, or even exceeded, 5 inches in length, but were too few in number and too poorly filled to satisfy the grower. The pods are, however, of good color and the peas the largest of any grown here. It is tall of vine and late in season.

Admiral Beatty. Refs. 94; Stumpp & Walter *Cat.* 1922. Admiral Beatty was raised by Laxton before 1920 when it received an Award of Merit from the Royal Horticultural Society. It was brought to the United States in 1922. It is said to have come from a Gradus x Alderman cross; and is intermediate in many ways between its two parents and an improvement on Alderman.

With us it grew from 3 to 4 feet tall, with a slender, seldom branched stem, abundant medium green foliage of which the leaflets were square tipped, but stipules pointed. It flowered at the 12th node and the resulting pods were rarely more than 4 inches long but otherwise like those of Alderman. The peas were fewer in number and not as large. The season was decidedly earlier and the crop better than that of either Alderman or Gradus.

SENATOR GROUP

The seeds of peas in this group are all well wrinkled, and with one or two exceptions contain both cream-colored and green-colored forms in varying proportions. One or two varieties have all cream or all green seeds.

Many varieties of this type antedate Senator, but are less known than that variety and often vary considerably from it in width of pod, which is intermediate between the narrow, slender-pod Evergreen and the broad one of Heroine. In general, the group corresponds, in the wrinkled peas, to the Scimitar group in smooth peas, in having noticeably curved pods. As Senator best represents the group, it is first described, in some detail, though chronologically, as the other varieties are arranged, it should follow several of them.

Senator. Refs. 9, 10; Burpee *Cat.* 1904. Senator originated with Webb previous to 1894 as a Prince

of Wales x Culverwell Giant Marrow cross. It has been widely distributed in England, and perhaps more widely in the United States, where it was introduced in 1904, and is known in France. It has been grown here from seed from three sources, one lot said to be Improved Senator. No considerable differences were noted, but the improved type was stouter-stemmed, more branched, bore more paired pods, and gave a better yield of pods, which however were not as well filled as those of one of the other strains, nor were the peas as large. The seeds of the Improved Senator were more wrinkled, smaller and all green, but the peas were of no better color than those from the mixed cream and green lots.

The general description of Senator follows:

Seeds moderately large, 110-120 to the ounce, only moderately wrinkled, cream and, largely, light green, round oval, indented,

sometimes nearly cylindrical, with obscure radicles, and yellowish green or green cotyledons; plants vigorous, $2\frac{1}{2}$ to 3 feet tall; stems slender, trailing (stout and more erect in improved strain), angular; foliage abundant, medium to dark green, consisting of even colored, non-characteristic leaflets in 4s (sometimes 2s) and large, deeply clasping, glaucous, whitened stipules with sharp tips and teeth from base well toward tip; flowers from 9th node, or above, white, not specially characteristic, on rigid stalks of medium length and thickness, usually single, but occasionally in pairs; pods single or paired, $3\frac{1}{2}$ to 4 inches long, of medium width, plump, moderately to much curved, with long-rounded points and very small tips or none, medium to dark green in color, usually well filled; peas 6 to 8, very large, smooth, round or slightly indented, oblong from hilum to tip, of good medium green color. The season of Senator with us was fully as early as that of Advancer, if not earlier, but it is usually considered somewhat later.

Shropshire Hero. Refs. 7; Gregory Cat. 1890. Shropshire Hero originated with Eckford before 1885, and reached the United States in 1890, where it has, from printed records at least, been more widely and more favorably known than in England or in France. From general similarity, it appears either a selection from Yorkshire Hero or the result of a cross with that variety as a parent. It differs from Yorkshire Hero in having more or less curved pods, so resembles Senator; tho the pods are more blunt at the ends than others of the group. When grown at the Station in 1893, Shropshire Hero was pronounced a vigorous half-dwarf variety giving heavy crops of large pods and good sized peas of first quality.

In recent tests, the variety differed from Senator in being stouter stemmed, with darker, very glaucous foliage, long leaflets, and proportionately smaller, less serrate and less whitened stipules; pods shorter and broader, rounded to blunt at the ends; peas much fewer and larger, more oval or oblong across the pod and more flattened the other way; seeds distinctly indented, flattened, very large, weighing 87 to the ounce. It was ready with Senator and gave good crops.

Heroine. Refs. 8; Gregory Cat. 1890. Early records of Heroine are almost identical with those of Shropshire Hero: Originated with Eckford, but in 1889, reached America in 1890 and more popular here than in England. It received more favorable notice in France, however, than did Shropshire Hero. At this Station, in 1893, it was said to be dwarf, and best of its class.

From printed descriptions, and as grown here recently, it is about a foot shorter than Shropshire Hero, more often branched at the base; foliage considerably lighter colored, with less numerous and shorter leaflets, sometimes serrate along upper edges, and large stipules having teeth to above the middle; pods single, from about the 13th node, and, except for the slight curve that links them with Senator, much like those of Telephone. It is later than Shropshire Hero and decidedly later than Senator, and gave nearly as good crops as the latter, which, with the larger size of the pods, makes it a desirable variety.

Eureka. Refs. 11, 12; Am. Gard. 19:202. 1898. Eureka resulted from an unknown cross made by Culverwell some years before 1894 and improved by selection previous to its introduction in that year by Sutton. Reports in an American journal show that Eureka was grown in this country in 1898, but we have not found it regularly listed. It was grown at this Station from the introducer's seed and from seed grown at the Idaho Station. The English seeds were much

larger, gave slightly taller vines and longer pods starting higher up the stem; but other differences were very slight.

Later than Senator, $2\frac{1}{2}$ to 3 feet tall, pods single, from 11th to 14th node, $3\frac{1}{2}$ to $4\frac{1}{2}$ inches long, broader than those of Senator, less curved, of about the same color; peas 6-8, those from English seed nearly one-fourth larger, but difference in size much less in original seeds; pods sometimes deceptive, the plumpness shown not always being due to the peas, as is the case with Senator. The crops were not as good as those of Senator.

Sutton's Best of All, introduced in 1900, is a dark-podded form of Eureka, in which the pods are also somewhat less curved. Sutton's Best of All was probably introduced in America about 1909; but as the name is identical with that of a much older McLean pea (see p. 61), known to have been in the United States for many years, it is impossible to speak positively on this point. The seed from which we grew the Sutton pea came from British Columbia; and the variety, except in the points mentioned, was very similar to Eureka grown from English seed.

Gladstone. Refs. 15; Burnett Cat. 1913. Gladstone was raised by Holmes before 1896, when the Royal Horticultural Society gave it most favorable notice and again honored a selected strain of it in 1912. It was probably this strain, or one still further selected, that came to the United States in 1913. The variety seemed exceedingly variant at first, as many references speak of two or more types or strains, of which the true one had curved pods that place it in the Senator group. As grown here, it had changed somewhat from the true type, as the pods were decidedly wider than those of Senator with the slight curve mostly toward the tip.

Plants rather taller than those of Senator, with stouter stems; foliage slightly lighter colored, leaflets usually in 6s, rather larger and broader, stipules proportionately smaller and less whitened; pods rarely or never paired, decidedly broader, less curved, more pointed, and with smoother surface; peas, when pods were ready to pick, smaller, not filling the pods as well, but of better quality than those of Senator, possibly because the appearance of the pods induced comparatively earlier picking, although the season was several days later; seeds somewhat larger. It was not as productive as Senator.

Delicatesse (*Petit Pois*, wrinkled). Refs. 18-21. The origin of the wrinkled, green-seeded type of Petit Pois peas is uncertain; but we first find it listed as Petit Pois (Delicatesse) by Carter, about 1901; and what is apparently the same pea came to us, indirectly, from Holland, as Delicates, and from an American seedsman as Petit Pois; while the Germans list Delicatesse Markersben. Carter says Delicatesse is very popular in Continental countries, and the name would indicate French origin; but whether the wrinkled type of Petit Pois originated in England and went to France, or *vice versa*, is not clear.

The Clark strain of Petit Pois, which we grew, was developed from a trial ground sample grown from English seed.

The plants are of Senator type, rather shorter in stem, with rather more and larger leaflets, and in the Petit Pois strain more branched and with more paired pods. The pods are shorter by nearly half an inch and slenderer than those of Senator and the peas are as

numerous, therefore much smaller. The "Delicates" strain was slightly later than Senator and the Petit Pois strain a full week later, both being quite as productive.

In 1908 Carter received from the Royal Horticultural Society an Award of Merit for his Evergreen (Delicatesse) pea which was not given when the variety was grown in 1925. This is a slightly dwarfer form of Petit Pois (Delicatesse) with larger and deeper green pods. In 1913, perhaps earlier, Carter listed Giant Delicatesse, which is taller, as prolific as Delicatesse and with much longer pods. These have not been tried here, nor, so far as we know, grown in America, tho Carter maintained an American branch for several years and probably distributed both of them.

In 1912 Sutton introduced an Improved Petit Pois, with green, wrinkled seeds, sending a sample of the stock to Rice. The pea breeders of that company, by selecting and roguing, built up from this English variety a very uniform strain for canners' use, which was introduced about ten years ago as Rice No. 13. In the hands of other seedsmen somewhat variant strains of this pea have developed.

It is generally from $2\frac{1}{4}$ to $2\frac{1}{2}$ feet tall, with stem and foliage very much like that of Senator, but flowering lower on the stem, about 12th node, producing some paired pods, medium green in color, $3\frac{3}{4}$ to 4 inches long, distinctly curved, about as broad as those of Senator and broader than Petit Pois, which are well filled with small peas, grading well when ready to can, of fair color and good quality. In our tests it did not yield as well as Admiral and was a few days later.

EDIBLE-PODDED GROUP

Edible-podded peas have been known almost from the first record of them, as Sugar peas, tho the peas themselves are little, if any, sweeter than those of cream-seeded Extra Earlies, and contain far less sugar than wrinkled peas. The varieties of the group are used in a way impossible with other kinds; as the pods of these varieties, lack, at all stages of growth, the fibrous, indigestible, inner, parchment-like lining of the valves — the endocarp — which makes the pods of other peas, even when boiled, impossible to masticate or digest. In edible-pod peas the endocarp is lacking, or so reduced in fiber content that the entire pod, with the immature peas, cooks tender and may be used exactly as are the pods of snap beans. Not only is the endocarp reduced or missing, but the mesocarp becomes thickened, fleshy and juicy, giving a "body" to the pod very different from the thin, shell-like structure of the pods of other peas.

The Edible-podded group of varieties has, it is believed, an earlier history than any other distinct group unless it be Field peas. Ruellius, 1536, wrote of peas of which the fresh pods and peas were eaten,¹ Gerarde in 1597 gave a figure of the straight-podded type of Sugar peas, and Worlidge in 1683 pictured the crooked-podded type. Before Worlidge, in 1629, Parkinson mentions Sugar peas, possibly the white-seeded type, and "Pease without skins," which may be the form derived from the Field pea, with colored seeds; and the catalog of Fuller, Tracy, Blackwell, London, 1688, lists Large White, Small White, and Grey Sugar peas.

Unfortunately for the horticultural systematist, definite names for varieties of Edible-podded peas are few, and the descriptions are so lacking in detail that it is now out of the question to trace the history of the varieties, or to co-ordinate names and synonyms. The scarcity of identifying names in the Edible-pod group does not mean any lack of names or of synonyms; but the designations given to varieties were combinations of descriptive terms ranging from the simplicity of Sugar to such nomenclatural monstrosities as Extra Early

Extremely Dwarf Small-podded Sugar, the combinations being so varied, so involved, and so often repeated with slight change, that only confusion results from collecting them. The situation is still further complicated by the passing of varieties back and forth between the Netherlands, Belgium, France, Germany, and England, each journey usually adding one or more new names, or synonyms. Later, America also contributed to the tangle by originating varieties; and usually followed the old descriptive-adjective style in naming them.

Two distinct sections of the Edible-podded group can, however, be separated with much certainty, as peas with pods lacking the parchment-like lining developed both from the white-flowered varieties of *Pisum sativum* var. *hortense*, with cream-colored seeds; and from the red and white or purple and white flowered varieties of the field pea, *P. sativum* var. *arvense*, with dark seeds, either self-colored or spotted. Of these two groups, the varieties with light colored flowers and seeds are the more agreeable to English and American palates, tho both types can be eaten in early stages without distaste; but in Continental countries the dark-seeded forms are fully as numerous and the rather rough, wild taste seems not displeasing to the consumers. Varieties of either type are not very much in demand, except locally, in the United States or England; but are widely used, tho not extensively, in mid-Continental and Scandinavian countries.

Owing to the confusion of names and synonyms, lack of histories, and the variation in descriptions, dates and measurements under different conditions, about all that can be done in arrangement is to place in a subgroup, under some fairly representative descriptive name, those varieties that are of the same approximate height, habit, size of pod, and season, since such varietal names as Alaska, British Queen and Advancer, found in other groups of peas to serve as types, are very few in the Edible-pod group.

Thickened pod walls characterize the whole group of Edible pod peas, whatever the color of flowers or seeds.

¹ There have, however, not have been parchment-less pods; but merely very young pods of smooth-seeded peas, which could possibly be eaten.

In most cases, also, the pods are much wider and flatter than those of other peas, loment-like, that is, constricted between the peas, similar to pods of the honey-locust, and usually more or less curved laterally, twisted and distorted. The peas are found near one edge of the pod, often extending only half or less of the width of the pod, the halves of the pod beyond the pea being in contact but rarely adherent. In consequence one border of the pod is plump or nearly so, the other almost flat. This

is especially true of the larger-podded types, these characteristics being decreasingly less marked in smaller-podded kinds. In the so-called "butter" peas, thickening or "fleshiness" of the wall, with lack of parchment lining, only, separates the pods from those of other peas, the constrictions between the peas and the flat margins disappearing almost completely, as well as the tendency to distortion; so that such pods are straight or slightly curved, and plump, cylindrical, or even thicker than broad.

VARIETIES IN EDIBLE-PODDED GROUP

WHITE-FLOWERED, CREAM-SEEDED SECTION

Very Dwarf White Sugar. Refs. 11-22. The peas in this first sub-section might be still further separated by classing a few as "extremely dwarf" or "Tom Thumb" Sugar peas, which would include the **Early Dwarf Dutch**, or **Very Dwarf Dutch Frame** of Vilmorin, the **Very Dwarf White Sugar** of Henderson, the **Very Early Dwarf (Edible Pod)** of this Station, and the **Extra Early Very Dwarf Edible Pod** of Gregory, all of which, if more than one variety, were less than one foot tall as grown in the United States. These varieties were connected by interlocking synonyms with others in this sub-group and even with those in groups generally very much taller.

The descriptions of these very dwarf varieties agree as to stocky, very short-jointed, zigzag stems, branched at the base and occasionally above, with rather scanty, deep green foliage, paired or single pods from the 8th to 10th node and above, which are 2 to 2¾ inches long, rarely 3 inches, narrow, only slightly constricted or loment-like, margined, and whitish green in color. All were very early or early, and apparently varied in productivity.

Of varieties 1 to 2 feet tall, the following may be named as grown or known in the United States, but not definitely separable: **Very Dwarf White Sugar** of Stumpp & Walter; **Common Dwarf Crooked Sugar** of Lawson; **Early Dwarf Dutch Sugar** or **Early Dwarf De Grace**, and **Common Dwarf Sugar** or **Dwarf Crooked Podded Sugar** of Burr; **Dwarf Royal Edible Pod** and **Edible Podded Dwarf** of this Station; **Dwarf White Blossom Sugar** of Landreth; **Dwarf White Sugar** of this Station, Dreer and Brown, and **Swiss** of Pacific Coast seedsmen.

Vines taller than of those varieties listed in the first paragraph mark all of those in this group, with pods of same size or even smaller, rarely larger, and apparently loment-like for all except **Edible Podded Dwarf**.

Dwarf Capucin, a variety from the Netherlands, Belgium or northern France, belongs in the group, and apparently maintains its identity.

It appears most to resemble **Edible-podded Dwarf**, but has shorter stalks and pods, and the latter are constricted, rather strongly recurved, and with long-rounded rather than blunt ends.

Dwarf White Sugars. Refs. 23-35, 40. In general, the varieties in this sub-section are from 2 to 3 feet tall, but may vary decidedly, in either direction, under differing conditions. The leading names are **Dwarf White Sugar** of Thorburn and Rice; **Prince Bismarck**, **Nippon Saya**, **Extra Early Dwarf Brittany**, **Dwarf Sugar** of Sinclair (1826) and Hovey (1859); **Ledman's**

Dwarf; **Dwarf Early Sugar** of Thorburn; and **Dwarf Debarbieux**.

Dwarf White Sugar of Thorburn, grown at the Station in 1882 and that of **Rice**, grown recently, were similar in height, and not unlike in pod length.

Height about 2¼ to 2½ feet; pods of the Thorburn strain 2½ to 3 inches long and of the Rice strain 2½ to 2¾ inches, but those of the older strain were quite irregular, often much constricted, contorted and pointed, tho on some plants straight and blunt-ended; while those of the Rice strain were all straight, constricted and blunt.

Prince Bismarck was grown here in 1887 and again in recent tests.

Exceedingly early, very small podded, especially in the later tests, but productive; pods straight, slightly constricted, plump, of fine flavor and texture when cooked. It was about 2¼ feet tall.

Nippon Saya is a Japanese variety of which seed came to us from the U. S. Department of Agriculture plats at McMillan, Michigan.

Height 2½ feet tall, with much longer pods, 3 to 3½ inches, broad, with wide wing, laterally curved and pointed at the ends.

Extra Early Dwarf Brittany was one of the better dwarf sugar peas as grown here in 1885, and is still a favorite in northwestern Europe.

It is quite similar to **Prince Bismarck** in season, productivity and size of pods, but with more rigid stems and twining tendrils which interlace and hold plants erect. The pods are only moderately fleshy, but abundant and of good quality.

Ledman's Dwarf was a favorite English variety, unknown here except as a synonym of **Dwarf Sugar**.

It was somewhat taller than the preceding varieties, sometimes 3 feet, and said by McMahon (1806) to be perhaps the most prolific and profitable of the whole family, and very delicious.

Dwarf Early Sugar according to Thorburn's catalog:

White-seeded, very early and of fine quality; but Paxton's description of 1834 makes it a variety of medium height or below, remarkably slender, long-jointed, with scanty, small, pale, yellowish green leaflets on long petioles, having small tendrils, small flowers, and rather small pods on long stalks. The pods were "roundish," well filled with very small peas. It was a second early and "an excellent bearer."

Dwarf Debarbieux was apparently much like **Dwarf Brittany**; but was not well described in the American reference.

In France it was 3 feet tall, with stocky branches and rather heavy stems supporting each other by intertwining tendrils, and bearing the top of the plant long, slightly curved, somewhat distorted, broad, winged pods with large white seeds. It was rather late, but productive.

Medium and Tall White Sugars. Refs. 36-39, 41-74. Among the very numerous edible-pod peas that

range in height from 3 feet to 6 feet or more several are also found by name or synonym in preceding groups; and no separation appears to be possible between medium and tall varieties, the names, synonyms and recorded heights being inextricably mixed. The following ones may be considered fairly representative of the sub-group: Dwarf White Edible Podded and Dwarf White Sugar of Sibley; Extra Early Edible Podded; Forty Days or Six Weeks White Sugar; Sugar, White Sugar, and Large White Edible-pod; Tamarind; Sabel, Scimitar and Giant Sword; Heinrich Earliest; Large Crooked Sugar; Saint Desirat, Melting Sugar and Mammoth Melting Sugar; Tall Sugar, Tall Crooked Sugar, Late Tall Sugar, and Tall White Sugar; Giant White Tall Edible Podded and Tall Moerheim Giant White.

Dwarf White Sugar, grown at the Station in 1883, and Dwarf White Edible Podded, grown the next year, seem to have been much alike:

Heights 4 to 6 and 5 feet, respectively, with long internodes, branched both at base and above, foliage medium in amount, size and color, slightly glaucous and usually somewhat whitened; with paired, pale pods $2\frac{1}{2}$ to 3 inches long, straight, moderately broad, blunt ended. They were very prolific, ripening in midseason and maturing gradually.

Extra Early Edible Podded, seed from France, was grown here recently.

Rather dwarfer than the above, occasionally less than 3 feet but usually 4, with shorter, narrower, plumper, more curved pods with blunt ends. It was earlier and not quite as productive.

Forty Days or Six Weeks Edible Pod, another French pea, appears to vary decidedly.

As grown in 1885 and again recently, in both cases from French seed, it was about 2 feet tall; but French descriptions and the crop as recently grown from German seed make it much taller, $3\frac{1}{4}$ to $4\frac{1}{4}$ feet. The foliage descriptions agree well, and the pods showed only slight variations. They were from 2 to $2\frac{1}{2}$ inches long, occasionally almost 3 inches, moderately wide and plump, straight or slightly curved, constricted, with rounded ends. It was very early and very productive.

Sugar and White Sugar were names found in early references for tall (6 feet), large podded (4 to 6 inches) varieties; which are apparently similar to Large White Edible Podded, grown at this Station in 1884. This last was also called Large White-Podded Sugar.

Height 3 to 5 feet, with a very "large" stem, with long internodes, branched at base and above, with light green, coarse foliage more or less whitened, and single, lighter colored pods, 3 to 5 inches long and an inch wide, bent and contorted, usually adhering closely to the peas tho sometimes inflated, round-ended, tender and crisp, but not as sweet as some varieties. It was a midseason variety, ripening promptly but not very prolific.

Tamarind was described by Burr in 1863; but it is not certain that it was ever grown in the United States. It was called "new" in 1834, and seems to have been described by many writers up to 1860, but not thereafter.

Late Dwarf Sugar was a synonym.

Height generally given as 3 to 4 feet, and said to be dwarf only in comparison with other sugar peas. It was of luxuriant habit, with large, dark green foliage, and very long (4-5 inches), broad, curved, fairly plump, well filled pods on long stalks. It was late but prolific.

The Sword Sugar peas, under such names as Säbel, Schwert, Scimitar, and Broadsword, appear to be rather modern varieties, originating within fifty years, and to be still grown in old or improved forms. Säbel was grown here from seed raised at McMillan, Mich.

Height 4 to $4\frac{1}{2}$ feet; stems stout, branches few, medial; foliage coarse but scanty, medium green; tendrils conspicuous, very slender; flowers from the 16th or 17th node; pods single, on short, thick stalks, 3 to $3\frac{1}{2}$ inches long, broad with wing nearly half the breadth, straight except for lateral curving and slight distortion, constricted, round to blunt at the ends, and only moderately fleshy, of a glistening, whitish green color and held freshness well. Season late, yield poor.

Improved Giant Sword was also grown here.

Similar in size to last, but with even stouter stems, more and finer foliage with leaflets in 6s rather than 4s, flowering one-fourth lower, and having longer pods, $3\frac{1}{4}$ to $4\frac{3}{8}$ inches, with rather less wing; late and poor yielder.

Large Crooked Sugar, or Broadsword, is, by that synonym, and Scimitar of Vilmorin, grouped with the Sword Sugars, but seems to be an older type. Ramshorn is also a synonym. It may date back to 1778, as the Large Sugar of Mawe-Abercrombie is said to have had very large, "bowed" pods. As Corne de Bèlier, it has long been known in France, and is still a leading variety in Eastern France and Switzerland.

Height, 4 to 6 feet, with a medium thick stem, long jointed, usually branched, pale yellowish green, rather coarse foliage, very large white flowers beginning at 12th or 13th node; and single, very long pods, 4-5 inches, an inch or more broad, much twisted somewhat like a ram's horn with 5 to 8 large peas, prominent in the pods even at early stages. It is fairly early, very productive, and of fine quality, ranking as one of the best in the class.

Heinrich Earliest is said to be from the Netherlands.

A week or more earlier than the Sword peas, not as tall, with slenderer stems without branches and with shorter, more curved, fleshier pods. It is a very fine quality sugar pea and fairly productive.

Tall Half-sugar is described in a French pea book as of American origin, but it has not been found, at least under this name, in American catalogs or literature.

Height $4\frac{1}{4}$ to $4\frac{1}{2}$ feet; seldom branched; foliage light green, medium in amount; flowers from the 6th node; pods on long stalks, single, numerous, of medium size, slightly curved, with little or no wing, plump and square ended. Early and productive.

The Melting Sugar peas, with two uncertain exceptions, Saint-Desirat Melting, and Carter's New Melting Marrow Edible-podded, appear to be of American origin, or at least to be listed only by American seedsmen.

All are characterized by tender, crisp, thick flesh in the pods which develops long before the peas are much grown and makes the table quality excellent. The pods are not especially long, rarely reaching 5 inches, but are broad. They are usually quite straight, but may be slightly distorted. Picking may begin in early mid-season and continue for two weeks or more until good to very good crops are secured.

Perfection Sugar, announced by Henderson in 1919, appears to belong in the Melting Sugar type, tho rather taller and with somewhat longer pods of even better quality.

Yellow-podded Sugar was an old variety, listed by Burr, apparently of the Melting Sugar type, but with very yellow pods, and seeds more oblong than those of most other varieties of the group. Color of pods alone recommended it, as it was not hardy or productive. It was said to be similar to **White-podded Sugar**, except for the color of the pods; but was white-flowered and white-seeded whereas **White-podded Sugar** was a *Pisum sativum* var. *arvense* descendant, with purple flowers and dark seeds.

The descriptions of **Tall Sugar**, **Tall Late Sugar**, and **Giant White** of Thorburn may be inferred from the names. They are very old varieties.

Inferior in thickness of flesh, earliness and productivity to Melting Sugar, and especially to the Butter Sugar peas, to be described later. They had yellowish-green foliage like Large Crooked Sugar, small flowers and single, large, broad, usually rather straight pods

Tall Edible Podded was grown at this Station in 1884.

Pods short, blunt ended and of good quality; extremely prolific, late, but ripening its crops very promptly.

Tall Moerheim Giant White, an old German pea, is better than its name would indicate.

Not specially tall, rarely reaching 4½ feet, and sometimes much shorter. It is really a Melting Sugar type pea, with 4 to 4½ inch pods, very broad, plump, straight, blunt ended, only slightly constricted, but very light in color. It is late, but very productive; and the pods are of fine quality.

WHITE-FLOWERED, WRINKLED-SEEDED SECTION

White Wrinkled Sugar Peas. Refs. 75-80. Wrinkling means little in Sugar peas, as the pods, to be of good table quality, must be used before any great difference in composition between smooth and wrinkled seeds can show itself. However, several varieties of white, wrinkled-seeded peas have fleshy pods, of which the following are best known:

Wrinkled Sugar, or **Knight Dwarf Marrow Sugar**, is perhaps oldest of the type, tracing to Thos. Andrew Knight who worked on peas early in the nineteenth century. It is still listed in France, but only as a minor variety, and was probably never grown in America.

It is a semi-dwarf, 2½ to 3 feet tall, with numerous, small, paired pods, generally straight, long-rounded at the end, with large tip, narrow, rather plump, not constricted. The seeds are white, wrinkled, square, or flattened and small. The lateness, small pods and comparatively poor yield make it not worth growing.

Another pea similarly named was grown at the Station in 1884 under the synonym **Wrinkled Edible Podded**.

Tall (5 feet); stems strong, much branched; foliage abundant, medium green, whitened not glaucous; pods pale, 2 to 4 inches long, rather blunt at the end, peas large, crowded. It was late, ripened slowly, and was very prolific.

Late Wyker Sugar and **Vilmorin Edible-podded** were very tall, late, wrinkled varieties with rather small pods, curved in the first, straight in the other. Vilmorin's pea had, also, a rather dwarf strain. All were late, heavy bearers with pods of good quality.

BUTTER SUGAR SECTION

Butter Sugars. Refs. 82-88. The edible-podded peas of this group are quite distinct from most of the others, the pods being thick-walled, but nearly round in section, or at least very plump, without notable constriction, and of most excellent quality, being fleshy, crisp, juicy and fine flavored.

Edible Podded Butter, grown at this Station in 1884, altho *Beurre* is given as a synonym for it, seems more like **White Thick-podded Butter** of Benary, which was grown here recently, than like *Vilmorin's Beurre*.

Both were 2½ feet tall, unbranched, with rather short internodes, medium green foliage, and rather small pods, strongly curved, slightly or not at all constricted and with about 5 peas. Both were fairly early and not very productive.

Tall Butter Sugar of Gregory, *Vilmorin's Beurre*, the **Thick-podded Butter** grown here from seeds raised at McMillan, Michigan, and the **Giant Butter** of England seem very much alike, also being 4 feet or more in height, with larger, more curved or sickle shaped pods, later, and more productive.

Pride of the Garden Golden Butter is like the dwarfers first described, with golden yellow pods. It was said to be early, very productive, and better in flavor than other sugar peas.

COLORED-FLOWERED, DARK-SEEDED SECTION

Varieties in this section are undoubtedly derived from *Pisum sativum* var. *arvense*, the field pea, and have bi-colored flowers with red or purple wings, purplish marking about leaf-axils, and dark colored seeds ranging from light gray, deeply pin-pointed with brown or purple, to deep self maroon. The seeds usually show much more wrinkling than do those of the white-flowered sugar peas. Nearly all of the varieties are more than four feet tall, and exceedingly similar. None of the varieties is as dwarf as a few in the cream-seeded section.

Dwarf and Semi-Dwarf Gray Sugars. Refs. 89-96. **Dwarf Gray Sugar** was described by Ferry in 1882, and by Denaiffe, Bolgiano and Brown.

Height less than 1½ feet, but in 1892 Ferry makes it 2 feet tall; and Allan, Dreer, Lindholm, Rice, and others, and tests at this Station in 1884 and recently, make it 2 to 2½ feet tall. Pods rather small, seldom over 3 inches, curved, sometimes distorted, blunt ended, small seeded, and fairly plump and fleshy. It is moderately early and quite prolific.

Dwarf Giant Podded, Prolific Giant Podded and **Dwarf Gray Edible Podded** were rather taller peas.

Stems stouter, branching, occasionally reaching 3 feet in height; pods 3 to 3½ inches or slightly longer, broad, much twisted, with more and larger peas. The size of the peas, with the rather thin flesh, made it necessary to harvest the pods early to avoid the disagreeable taste from the colored peas.

French Dwarf Sugar, listed by Thorburn in 1892, may, or may not, have had colored seeds as do the taller French Sugars which follow.

Tall Gray Sugars. Refs. 81, 97-125. The Tall Gray Sugar peas fall into several groups based on some rather characteristic part of the name; but such groupings are purely arbitrary and if at some time based on

varietal differences, these have disappeared with time or by the duplication or repetition of synonyms.

French Sugar, described by Sutton, was grown here recently from his seed and others from British Columbia.

Very tall, flowers very high on the stem and bears single 4 to 4½-inch pods, very broad, almost straight, not greatly constricted or distorted, with quite wide wing, and with 5 to 8 rather large, considerably pitted and wrinkled seeds, from light brown with very fine, obscure, purplish pin point dots to self colored dark maroon. It is late and not productive and the flesh is rather thin.

Red Flowered Sugar, or **Chocolate**, was described by Burr, but probably not grown in the United States. It was tall, late, and evidently much like French Sugar.

Giant Sugar, with its various synonyms (Refs. 101-104a) is characterized by huge pods from 4½ to more than 6 inches long, broad, flat, poorly filled, much constricted, and distorted. The purple coloration at the nodes of the stem is very marked. Height in Europe varies from 5 to 7 feet, in America from 4½ to 6 feet. There are apparently two types in this group, not usually distinguishable by name, the taller form being very late, with smaller, paired pods; the other shorter-stemmed, less vigorous, earlier and with single, larger pods.

Giant Florentine is said to be similar to Giant Sugar, but with pods generally straighter. This was confirmed by Station tests of the two, the pods being checked as "slightly curved" for the former, with little distortion, and "much curved" for the latter.

Giant Switzerland, in our tests, was indistinguishable from Giant Florentine except, possibly, for pods rounded to blunt ended for the latter, blunt ended to square for the former.

FIELD PEAS

Nearly all of the so-called "field" or "feeding" or "hog" peas have at some time and some place been used for human food; and many of them are extensively used as boiling peas, or, either whole or split, for soup making. The varieties with colored flowers and dark seeds, the true field peas, *Pisum sativum* var. *arvense*, are used in some European countries for consumption in the home; but the wild, slightly acrid taste of peas of this type does not appeal to English, French, or American palates; so they are rarely grown in these countries except for feeding animals, as soiling, pasturage, hay or grain crops.

The minor importance of field peas for human food, with our necessarily limited space, prevents detailed descriptions of these varieties; but roughly classified lists of them are given, those marked with * having been grown in our tests and described on our note sheets. The varieties in each sub-group are arranged somewhat in the order of their time of fitness for use as garden peas, as recorded in our notes; and occasional annotations call attention to particular merits or demerits of the variety.

The general arrangement follows the plan indicated below:

The **Luscious** sub-group includes varieties with pods very similar to those of the **Melting Sugar** sub-group of cream-seeded peas; but the plants are taller, usually 4½ to 6 feet. **Luscious** has pods shorter by about a half inch than varieties with **Mammoth Luscious** as part of the name, in which the pods run from 3½ to 4½ inches, not quite as large as those of **Giant Sugar**. A decided admixture of gray seeds with those much darker seems to characterize the **Luscious** varieties, and separates them from the next sub-group.

The **Mammoth-pod Sugars** are very similar to the preceding ones; but the seeds are quite uniformly dark brown or maroon, similar to but even darker than French Sugar, tho smaller.

Grey Sugar, **Tall Gray Sugar**, **Sugar and Salad Sugar** are similar in the predominance of "gray" seeds, that is, seeds with rather light fundamental color, densely marked with very fine pin points of darker shade, the self-colored brownish seeds being relatively less in number. **Sugar** has somewhat larger pods, almost as large as those in the **Giant**; but the others, except for the seeds, are like those of the preceding three groups.

Fishamend's Sugar was described long ago in an American periodical; but may never have grown in this country. It is notable for its tallness, reaching 7½ feet. The seeds were small, apparently much like those of the **Gray Sugars**. The pods were large, "much curved," and said to be best of all except **Large Crooked Sugar**.

White-podded Sugar bore pods like those of the **Giant Sugar** type, but very light colored. It was 4 to 5 feet tall as grown in America, late, not specially productive nor were the pods of as good quality as those of many other varieties.

Character of seed: Cream (white) -seeded, cream-seeded with black eyes, green-seeded, or dark-seeded.

(I) Short-vined, under 3 feet.

(a) Short-podded, under 2½ inches.

(b) Pods of medium length, 2½ to 3 inches.

(c) Long-podded, over 3 inches.

(II) Vines of medium length, 3 to 4 feet.

(III) Long vines, over 4 feet.

(IV) Minor characters unknown.

CREAM (WHITE)-SEEDED SECTION

(I, a) ***Golden Vine** (much taller in Station test, 1884), ***Kobilya**; (b) ***Agnes** (good North, poor South), ***Nelson** (good). (II, a) ***Smiley**, ***White Canada** (both very good), **French**, **Small French**; (b) ***Brown Abyssinian** (early); (c) ***Archer** (pointed pods). (III, a) ***Wellwood**, ***Amraoti**, ***Canada Field**, ***Canada Yellow Field**, ***Farnham**, ***French June** (= "June," Kovaleff) (very good), ***Gregory**; (b) ***Andes**, ***White Colorado** (= **Colorado**), ***Clamart**, ***Multiplier**, ***Arthur**, ***Golden Marrow**, ***Valencias**, ***Victoria**; (c) ***Canadian Beauty**, ***Colorado Field**, *(1884) **Golden Drop**. IV. **Pearl**, **Suffolk** (both excellent split-pea varieties), **Supenau**, **White Hundredfold**.

CREAM SEEDED, BLACK-EYED SECTION

(II, b) ***Paragon**. (III, a) ***Chang**; (b) ***Canada**, ***Prince**; (c) ***Black-eyed Marrowfat**. (IV) **Black-eyes** Nos. 1 & 2.

GREEN SEEDED SECTION

(I, a) * (1884) **Dwarf Blue Imperial** and **Dwarf Blue Prussian**, **Brunswick Green**; (b) **Dominion** (poor), ***Blue Bell**,

*Openshaw (1½-2 ft.), *Blue Canadian, *World Prize. (II, a) *Bangalia (purple-flowered, seeds tinged brownish), *Scotch Beauty, *Scotch Blue; (b) *Green, *Ball. (III, a) *Scotch (late); (b) *Blue Imperial, *Blue Prussian, *Vida, Russian Blue (very good). IV. Albany (Dwarf Green Albany), Common Blue, Early Blue (from Canada, good), Green Canada, Green Scotchman; (c) *Puslike.

DARK-SEEDED SECTION

(I, b) *Mummy (= Early Crown). (II, a) *Early Heavy Cropper (good), *Cavalier, *Meyer, *Cossack, *Delano, *Kaiser,

*Carleton (= Peluschka, = Partridge) (very good); (b) *Negro (purple-podded, = Nero), *Killarney, *Solo (lacks purple markings on stem), Black English; (c) *Peluschka. (III, a) *Hubert, *Fraile (very good forage pea), *French Gray, *Husbands, *Austrian Winter; (b) *Maple Partridge Brittany, *Early Britain; (c) *Maple, *Partridge, English Brown or Speckled (very tall). (IV) Common Gray, Gray Hastings, Gray Rouncival, Gray Warwick (= Early Nimble Hog Pea), Gray Winter (= Winter), Late Gray (= Tall Gray, Tall Capucine, Large Gray), McAdoo (= Kaiser), Scotch Gray.

Character unknown: Strawberry Vine, Field Creeper.

MINOR VARIETIES OF EXTRA EARLY GROUP

Superfine Early, given by Burr (1863) as a synonym of Charlton, was mentioned as a separate variety by Booth (1810).

Michaux de Rouelle, generally considered identical with Hotspur, was grown at this Station in 1883 (*Rpt.* 3:253. 1885) and seemed the same as that variety as incompletely described years before:

Rather tall; stem heavy, branched at base; pods of medium length, broad, plump; crop rather late, slow maturing, good.

Eastern Shore, generally held same as Charlton, was said by Loudon (*Gard. Mag.* No. 77. 1836) to be later; tall, slender-vined; producing freely small, short, round pods with 4 to 5 peas.

Booth Early (Booth *Cat.* 1810) is the earliest American variety of the pea found recorded; undoubtedly a strain of Hotspur or Early Frame.

Early Dwarf (Syns. Earliest Dwarf, Russell Early and Early June) was grown by C. M. Hovey (*Mag. Hort.* 10:91. 1844). He thought it originated from Hotspur or Charlton.

Found very hardy, a strong grower and fair producer of long, narrow, poorly filled pods with 6 or 7 peas.

Tall Frame was described, from an English source, in an American periodical in 1836 (*Am. Gard. Mag.* 2:438) and may never have reached America. A taller, slenderer strain of Charlton.

Racehorse. Refs. 15, 16, 30. Rogers described Racehorse in 1839 as of recent origin but already popular; as very prolific and particularly adapted for a first crop, "coming into bearing ten or more days before any other sort." Mentioned in America in 1844, and as grown in 1845 pronounced "not of merit." Generally considered same as Early Warwick, but once given as a synonym of Cedo Nulli.

Early Burlington (Refs. 27, 131a) seems to have come from seed of Landreth Extra Early, furnished by Landreth to Thos. Hancock, Burlington, N. J. It may have been improved by selection to justify the new name. Ferry connects this with Philadelphia Extra Early, thus strengthening the presumption that the latter is a strain of Landreth's older pea.

Michaux ordinaire and **Michaux de Hollande**, referred to under Early Emperor, were grown at this Station in 1926, from seed raised by the U. S. Department of Agriculture, at McMillan, Mich. They are typical extra earlies, with more abundant foliage, larger flowers borne lower on the stems, and decidedly larger peas and seeds; pods better filled, plump and from 2½ to 2⅞ inches long in each variety, but characteristically small-tipped in Michaux ordinaire. This was a week earlier than the other.

Danecroft Rival (Refs. 42-45) was raised about 1837 by Girling but was also known as Warner's, from the seedsman who handled it. It was Early Emperor in everything except color of foliage and pods, a peculiar glossy, sickly green due to lack of bloom. Only a curiosity, but received several other names, or several other varieties very similar to, if not identical with it, were developed. The latest of these, Sutton's Emerald Gem, was said to be from entirely different stock; and is given a separate description.

Cedo Nulli (Refs. 31 (Racehorse), 38, 46-49), later synonymous with Early Washington, appears to have had a separate origin and independent history. Credit for it is given (*Mag. Hort.* 4:87. 1838; and 5:87. 1839) to Sinclair and introduction dated 1838.

An improved Early Frame; 3 feet high, of strong growth; pods of good size, long, nearly round, peas 6-8, of excellent quality; very early and prolific. To this *Rural New Yorker* (12:271. 1861)

adds: Season 69 days to edible maturity from April 26, grows finely, yields well; peas sweet, very fine; "an excellent pea."

Superior First Early (Ref. 50), an English strain, credited to Farnes, probably came to this country as one of the "First Earlies" cataloged by American seedsmen; but no direct connection has been traced. It is mentioned here to show uncertainty of interpretation of printed data; as it was said (*Gard. Chron.* 630. 1843; and 535. 1844) to be "ready 10-14 days ahead of Early May" and the next year "much later than Early May."

Early Nimble Dick. Ref. 59. Undoubtedly a synonym of Early Frame; but listed only in America; 2½ feet high.

Hill Extra Early. Refs. 60, 61; Burr *Fld. Gard. Veg.* 529. 1863. This variety was introduced some time before 1844 by Hill; but seems not to have spread very widely, tho continued for many years. Now entirely superseded. By Burr it is placed under Charlton, as a pea as hardy and nearly or quite as early and prolific as Daniel O'Rourke and several of the most approved, earliest foreign varieties, and much more stocky and vigorous.

Three feet high, of strong growth; with long, very large, round, full pods, ready in two pickings and containing 7-8 peas of excellent quality.

True May (Refs. 28, 65) may be distinct from Early May, and shorter-vined.

Bedalean. Refs. 66, 67; *Gard. Chron.* 97. 1848. This strain of Early Frame was introduced by Jackson in 1847, as "6-12 days before any other;" 3½ feet high, with handsome well-filled pods, and prolific; but in tests made by the Horticultural Society of London was found of no particular merit. Probably never in America, tho the name occurs as a synonym of other varieties grown here.

Fairhead Early Champion (Ref. 71) was not listed for some years after Sutton Early Champion, but may be identical with it; since it is said to be similar to Warner Early Emperor in pods; and Warner Conqueror, identical with Sutton Early Champion, is also a synonym of Early Emperor. It was very early.

Fairhead Early Conqueror (Ref. 72) was advertised as new by Sutton in 1854; but there is such confusion in the pea notes of the time between Fairhead and Fairbeard, Conqueror and Champion, that it may or may not be distinct.

Railway. Refs. 73-76. As this pea was introduced in 1859, some years before Dillistone Early, Carter's First Crop and Sutton's Ringleader, each pronounced identical with the others and with Railway, the credit for originating peas of this sub-type should be given to Isherwood, introducer of Railway. McIntosh says Railway is only a variety of Early Frame, of no special merit. Unknown in America under this name.

Hovey Extra Early (Refs. 86; Burr *Fld. Gard. Veg.* 529. 1863) was raised before 1852 by Pope, and sold to Hovey. It was called "the earliest variety yet introduced," and, later, "an American improved early sort of Charlton." It was said to be hardy, and prolific. Not in Bailey's list of varieties for sale in 1889.

Taylor Prolific (Refs. 88, 89; *Jour. Hort.* 48:378. 1872) was introduced in 1852 by Bass and Brown and is included here only because listed by Burr, who says it is similar to Daniel O'Rourke in habit, production, and early maturity. A later English description makes it similar in shape and size of pods to Sangster No. 1, strictly single-podded, and very superior to old Early Kent, "from which it has, no doubt, originated."

Sebastopol. Refs. 97 (second), 100-102; *Burr Fld. Gard. Veg.* 547. 1863; *Hogg Gard. Yr. Bk.* 14:72. 1873. Advertised in 1855 by Dawe, Cottrell and Benham, London, as Cottrell's Sebastopol. Hogg makes Early Sebastopol a synonym of Early Emperor. Listed in America in 1859 as Sebastopol, described by Burr, but said by Professor Goff to be synonymous with Daniel O'Rourke.

Slender-vined, single flowered, pods $2\frac{3}{4}$ inches long, peas 5 to 7, which, like the seeds, were "scarcely distinguishable in size, form and color from the Early Frame or kindred varieties." Not specially early, but very productive, and of superior quality.

Beck Morning Star. Ref. McIntosh *Bk. Gard.* 2:67. 1855. The only record of Beck Morning Star, except as a synonym, says it was 3 feet high and podded early and freely.

Far-Famed Sir Moot. Refs. 103; *Cultivator* 47. 1888. An extra early pea from Austrian (Australian?) stock.

Dunnett First Early. Refs. 104; *Country Gent.* 35:614. 1870. In 1858 said to be "in every way superior to Daniel O'Rourke," earlier, with finer pods and peas of richer flavor; $2\frac{1}{2}$ feet high. In 1870 noted as grown in America.

Dillistone Early. Refs. 51, 56, 105-109a; *Burr Fld. Gard. Veg.* 532. 1863; *Jour. Hort.* 33:467. 1865; *Gard. Chron.* 221. 1866, and 701. 1867; *Am. Hort. Ann.* 135. 1867. Railway and Dillistone Early preceded First Crop and Ringleader which proved identical with them; but they have never received as much notice. Dillistone First Early, advertised in 1859, was said, later, to be from a single plant in a row of Bryant, or Bradman, Wonder, a variety otherwise unknown. Tho considered by most writers as identical with previously introduced varieties, others thought it much earlier and with a special tendency to open all blossoms at once and to produce its pods for a single picking. It was described by Burr in 1863 and mentioned in several American catalogs and periodicals of the period, but apparently never widely grown.

Petersburg (Ref. 110) was recorded in 1860 as an early pea not as good in flavor as Early Warwick.

Early Princess. Refs. 111-115; *Rural N. Y.* 12:271. 1861. Early Princess is apparently an American variety, entirely distinct from Princesse given by Thompson as a synonym of Tall White Marrow.

Referred to as new in 1861 and said to have a shorter season than Daniel O'Rourke, taller vines and somewhat sweeter peas; but later references call vine "low, short, dwarfish," $2\frac{1}{2}$ feet high, praise quality of peas and give color when cooked as lively green. When sown very late, pods were ready in 40 days, but when sown five weeks earlier it required 65 days to picking. The 5-6 small, round peas, with the points given above, clearly place the variety in the Extra Early Group.

Carpenter Express. Refs. 117, 118. Seeds of most of several "Express" peas are blue or green; but this white-seeded one was introduced in 1863 by Carpenter as "the earliest pea known with large pods." It was soon held to be identical with Sangster No. 1, Daniel O'Rourke and others of the group, tho attention was called to its very white flowers. It is uncertain whether this white-seeded form was known in America.

Wheeler Extra Early. Ref. 129. Tested at the experimental farm in Washington, D. C., in 1865, and found very similar to First Crop; not "a week earlier than Daniel O'Rourke or Sangster No. 1," as claimed for it.

Double Extra Early. Ref. 130. Deacon's Double Extra Early was listed in 1865 by the Superintendent of the Department of Agriculture Experimental Farm, Washington, D. C.

Taber Early Perfection. Refs. 136-138; *Evans Cat.* 1868. This pea was advertised in 1866, by Veitch (1), as originated by Geo. Taber; but is evidently older. Listed in America in 1868 as among the earliest varieties, but name was given by Goff as a synonym of Caractacus.

Said to have been very early, of robust habit, a day or two later than Sangster No. 1; and more viny than that variety or Daniel O'Rourke; recommended as the "heaviest cropping first early."

Poynter Earliest and Best. Refs. 139-41; *Gard. Chron.* 630. 680. 1868; *Ann. Hort.* 123. 1889; *Salzer Cat.* 1900. An Earliest and Best pea was noted in 1865 as grown for several years,

and was advertised under his name in 1866 by Poynter. Poynter Earliest and Best was briefly mentioned as being as early as Ringleader, more productive and vigorous; but was found at Chiswick to be the same as Daniel O'Rourke. It is unknown whether or not this is the Earliest and Best advertised in 1900 and noted as having been sold on the La Crosse, Wis., market for 25 years; but we have no record of any other pea thus named dating back so far. Bailey reports an Earliest and Best on sale in 1889. The Wisconsin strain was described as "the earliest white pea on earth," $1\frac{1}{2}$ to $2\frac{1}{2}$ feet high, extremely prolific, with 8 to 12 straight pods, each containing 7-8 medium sized, smooth, round peas, yellowish white when ripe.

Electric (Ref. 142) was listed as new in 1869, by Ferre, Batchelder & Co., and said to be 2 feet tall and very early. Its height separates it from the Electric tested by this Station in 1890. Dreer's Electric Extra Early is green seeded.

Buist Extra Early (Ref. 149) was introduced about 1871 and said to be "better than Charactacus as a green market pea."

Extra Early Winship (Ref. 150) was listed as new in 1872, Gregory considering it a remarkably early American pea, an improvement on Daniel O'Rourke.

Hancock. Refs. 155, 156; *Country Gent.* 14:266. 1859; *Gregory Cat.* 1885; *Mich. Sta. Bul.* 144:233; 1897; *Buist Cat.* 1913. Hancock was listed in 1878 as a new American pea, but without indication of its source. In a letter in *Country Gentleman* Landreth says Early Burlington originated from seed of Landreth Extra Early in the hands of Thos. Hancock, Burlington, N. J.; and it seems not at all unlikely that Mr. Hancock continued his selection in Early Burlington and introduced a new strain under his own name. This is merely conjecture, supported by Buist's statement that Philadelphia Extra Early originated in that city and was originally called Hancock, so that the latter may well have been developed in the near-by Jersey section and found such favor as to be renamed for the city itself. If so, Hancock precedes Philadelphia chronologically.

Descriptions of the pea are exceedingly meager. The horticulturists at the Michigan Station say it was so nearly like Rural New Yorker that no marked differences could be detected; but they do not make either name a synonym of the other.

Boston Extra Early. Ref. 160. Listed by Vaughan in 1883.

Carter New (Ref. 161) was sent to America in 1883 for testing in advance of its introduction in 1884, by Carter.

The figure given shows a very small, straight, square-ended pod, borne singly, and exceedingly large stipules, considerably longer than the pod. The notes describe Carter New as ready for use at the same time as Ferry First and Best and Henderson First of All (67 days from April 6), with more pods then ready, but not maturing promptly, and with the yield of peas much smaller,—very little more than half of Henderson's First of All. The seeds were very small, smooth, and buff in color.

Veitch Selected Extra Early (Ref. 163), probably not grown in America, was said by writers to be "a week ahead of Dickson First and Best; prolific," and "best early pea I ever saw and most prolific bearer."

Ferry Extra Early. Refs. 164; *S. Dak. Sta. Buls.* 85:4. 1904, and 91:5. 1905. Introduced by Ferry, carried in the catalogs of the firm until 1898 or later and then dropped, probably as inferior to First and Best since it was not as even in vine and pods, did not ripen its pods as promptly tho some were as early, and the peas were rather larger. In Prof. Goff's description, no points are given that would enable us definitely to separate the strain from others. Cooking tests revealed little in favor of the peas.

Reedland. Refs. 167; *N. Y. Sta. Rpt.* 3:245. 1885. Received in 1884 from Landreth for testing at this Station and found second early in season and not productive. It appeared to be a sub-variety of Philadelphia.

Vick Extra Early (Ref. 169) as received from Vick, and tested at this Station in 1885, proved to be really early, with pods ready to pick in 55 days from April 24; but gave few pods to the vine and few peas to the pod. It was considered a synonym of, or selection from, Early Kent.

Gem of the Season (Ref. 178), credited to Daniels, was introduced about 1885, but probably never regularly in commerce in America. It was grown at the Station in 1926, from seed furnished by the U. S. Department of Agriculture from its 1925 crop at McMillan, Mich.

Pods $2\frac{1}{2}$ -3 inches long, plump, blunt ended; peas 4-5, medium sized whitish green, edible in 68 days; seeds regular Extra Early type; crop only fair, ratio of peas to pods not high, quality of the peas not more than fair.

Smith Extra Early. Refs. 179; notes of Prof. Goff. 1885. It is doubtful whether this pea properly belongs in the group; but the name places it here, tho its curved pods would place it in Scimitar group or Senator group, according to unknown character of seed.

It was found as a "sport (?) of Alpha" by H. N. Smith, South Sudbury, Mass., and after careful selection for several years was introduced in 1885. In the Rural Experiment Garden the plants were a foot taller than those of Rural New Yorker, but Prof. Goff found it only $2\frac{1}{2}$ feet high. It was decidedly later than the better Extra Earlys, a better bearer, the pods generally paired, of better color, longer but more slender, and more scimitar shaped. Apparently it never attracted much attention.

Snowflake. Refs 189; Buckbee Cat. 1918. Snowflake was a selection from Early Kent, made by Alexander in 1886, but not introduced until 1892; earlier than the parent variety, more dwarf, more prolific, and of better quality.

This, or some other Snowflake, was called a field pea in 1918

Hampden Earliest. Refs. 193; Vt. Sta. Rpt. 160. 1890. As tested at this Station in 1888 considered a strain of Philadelphia. The seed of this pea came from B. L. Bragg & Co., Springfield, Mass., which is near Hampden. The Vermont Station called it early, but the figures for pods per vine and peas per pod make it unproductive.

Lee Earliest (Ref. 194) is known only by the name.

Premier Extra Early. Refs. 200; Buist Cat. 1913; also letter from Buist, Nov. 24, 1926.) Premier, an Extra Early introduced by Buist, was a selection from Daniel O'Rourke and the firm's favorite early pea before Morning Star and was selected from it. It dates prior to 1889, when both strains were listed by Bailey. The introducer specifies earliness and prompt ripening of all pods as prominent characteristics of the pea.

Early Morning, Early Morning Star, Morning Star. Refs. 201-204; Kans. Rpt. 152. 1889; letter from Buist, Nov. 24, 1926. Since all of these peas, if not identical, came from Buist before, or in, 1889, they are here grouped as one variety. They have no connection with Beck Morning Star, synonymous with Early Emperor; and they are also quite distinct from the Morning Star of Hammond and that of J. L. Childs (if these are not the same), of which the seeds are wrinkled. Buist Morning Star was selected from Premier Extra Early.

Morning Star (seeds from Buist) and **Early Morning Star** (seeds from Maule) were both grown here for three seasons, and seemed to differ slightly the first year, when the detailed descriptions were made; but the differences are probably attributable, in the main, to poor germination of the Early Morning Star seeds and lack of vigor in the plants, which resulted in less abundant foliage and a very poor yield. The crop of Morning Star was better, plant for plant, though still only "good." Morning Star was a day or two earlier than the so-called early strain, its pods longer and averaging one pea more to the pod; but the pods of the other strain were very plump, being thicker than broad, and the individual peas were larger. These differences diminished in crops grown the second year from the same lots of seed, and disappeared the third year when the two strains were grown from crop seeds of the first year. Data from the early Station trial of Early Morning are incomplete, but do not separate this strain from either of the other two.

Orange County Morning Star (Ref. 205) may be merely a synonym of Early Morning Star, but no connection is evident between either the Buist Co. or Philadelphia, and Orange County, so it is listed separately. It was offered for sale in 1889.

Extra Early Challenge. Refs. 208, 209; Currie Cats. 1906, 1926. Extra Early Challenge was apparently introduced by Currie previous to, or in 1889; and was said to be very extensively grown

in 1906. It may be the same as Challenge, later Iowa Challenge, listed by the Iowa Seed Co., and described on page 29. At the Michigan Station it was among the earliest peas, but was not productive. It was only $1\frac{3}{4}$ feet high, which may indicate a poor pea season, and account for the poor yield. It is still carried by the firm introducing it; and its earliness, short season and productiveness are featured.

Ely, Faust, Johnson & Stokes, Maule, Plant, and Wilson Improved Extra Earlys. Ref. 212. Each of these varieties was listed for sale in 1889, in the catalog of seedsman whose name is attached.

Forty-two Days (Ref. 221) was introduced by A. D. Perry & Co., Syracuse, N. Y., previous to 1889, when listed by Bailey. It was carried by Perry's successor for several years, then abandoned for Alaska and the early wrinkled peas. It had a local distribution.

Electric (Ref. 224; and unpublished notes), from J. F. Tillinghast, La Plume, Pa., was tested at this Station in 1890.

It was tall ($3\frac{1}{2}$ feet), early, productive, with light green foliage having small stipules, and bore straight, pointed pods containing 6 small, smooth, whitish peas, not of the best quality. The pointed pods might exclude it from this group.

Budlong (Ref. 225) was introduced by Leonard before 1890. Tested at the Michigan Station, it was called a strain of First and Best or Extra Early, and was productive, averaging 6-8 pods per vine and 5 peas per pod.

Nebraska Lightning (Ref. 226) was introduced in 1891 by the Emerson Seed Co., Omaha, Neb. It probably was Carter's Lightning, which came to America shortly before this date.

Family Garden. Refs. 227; Maule Cat. 1894. Family Garden was introduced prior to 1892 by Maule. It was Maule Extra Early, with its cropping season extended so that it could be used for from one to three weeks from its first edible maturity, at about 45 to 50 days, "an excellent, smooth early pea." A letter from the introducing firm says it is an "improvement on Improved Extra Early" and one Improved Extra Early, at least, is Pedigree Extra Early. As sown in Kentucky on April 29 it was ready in 53 days, a scant bearer of large, well-filled pods.

Extra Early Market Garden. Ref. 228. Johnson & Stokes called this variety, introduced before 1893, a strain of their Selected Extra Early, announced after several years of careful selection. It was said to be $1\frac{1}{2}$ feet to 2 feet high, earlier than the parent stock, with full, round, dark green pods of strong texture for shipping. In 1893 introducers claimed an annual sale of 5,000 bushels of seed of this variety to market gardeners.

Despot. Refs. 233; letter of Dec. 18, 1926, from Tait. Despot is an old variety, said to have come from Daniel O'Rourke, used in the South for many years because of its dwarf habit, vigorous growth without vininess even in wet seasons, resistance to drouth, and heavy yield of small pods. The peas were only medium in quality.

Canada Extra Early (Ref. 234) was listed by Landreth in 1896 as an early pea of somewhat variable quality.

Evergreen Pod (Ref. 235) was listed as new by Landreth in 1896.

It was said to be $1\frac{1}{4}$ feet tall, almost as early as Landreth Extra Early, very productive, with pods very dark green in color, which they retain long. Valuable as a shipper.

New York Market. Ref. 236; Pino Cat. 1923. Though listed as a variety, correspondence reveals that, recently at least, this name is applied to any one of several strains of Extra Early, according to the availability and price of the seeds in the current season, and the general reputation for earliness and productivity of the variety selected for the honor.

Earliest Market (Ref. 236a), listed in 1899 by Elliot, was a very uniform, robust strain of Extra Early, $2\frac{1}{2}$ feet tall, with very plump, rounded pods.

Record Extra Early (Ref. 237) was introduced in 1898 by Johnson & Stokes, and said to be the result of nine years' careful selection from that firm's Extra Early Market Garden.

Dandy Extra Early. Ref. 238. Michell introduced this variety in 1899 as a selection from the first crop of Eureka Extra Early.

As grown at the Station in 1922 and 1923, a typical Extra Early, differing in no essential characteristic from the average of the type. The stems were sometimes branched at the base, and the pods, though well-filled, were, perhaps, more rounded than blunt or square at the ends.

McLean First and Best. Ref. 239. In a test of peas in England in 1901, McLean First and Best was found a "fortnight earlier than Sangster No. 1."

Perfection. Refs. 240; Grey Cat. 1913. Perfection, cataloged and given in Tracy's list of 1901, is a typical Extra Early in pod, seed, and season; but the plant is very short, from $1\frac{1}{2}$ to $1\frac{3}{4}$ feet in height. It apparently differs, in this respect, from the Perfection given as a synonym for Maud S, and from Taber Perfection, a Sangster No. 1 type pea, while the seeds are too round and too small for Harrison Perfection. Practically all of the very numerous other Perfection peas are of the wrinkled type.

Special Extra Early. Ref. 247. As described by Michell in 1902, his Special was earlier than other Extra Earlies, only 2 feet high, an immense cropper, with tender peas of highest quality.

Grown here recently for three seasons it was as tall as other strains, $2\frac{1}{2}$ to $2\frac{3}{4}$ feet; began to flower low, 7th node; with a few basal branches; foliage abundant, between medium and light green in color; pods rarely in pairs, short, 2 to $2\frac{1}{2}$ inches; peas small, 5 to 7 in a pod; occasionally compressed, light green; seeds somewhat pitted and indented. It was nearer a second than a first early, but matured its crop promptly.

Keeney Extra Early (Ref. 248) was grown for a cooking test in South Dakota in 1903. It originated with Keeney, probably just before 1903.

It was $2\frac{1}{4}$ feet high, among the earliest, with pods 3 inches long and more than half an inch wide, averaging only 5.1 per vine, and containing 5.9 peas of poor quality,—not tender nor sweet, but dry, starchy and tasteless. (See Pedigree Extra Early and First in Market.)

Northwest Premier (Ref. 249) was introduced prior to 1901 by May. It was said to be "10 days earlier than any other pea; an immense cropper, with pods of same attractive color as the vine;" but no actual test records of it have been found. It was listed in 1901 by several seedsmen.

Triumph (Refs. 250, 251) was listed in 1901, probably before by Griffith & Turner,¹ as Extra Early Triumph.

As grown at this Station in 1922 and 1923, an early type, about 2 feet high, unbranched; pods small ($1\frac{1}{8}$ to $1\frac{5}{8}$ inches), typically shaped from 8th or 9th node, single; peas 5 to 6, rather large; seeds largely green, decidedly pitted or almost wrinkled. The crops of pods were good.

Good Luck. Ref. 252. In or before 1905, J. Bolgiano introduced Good Luck as being much better than Alaska in many ways.

As grown here for three seasons, from the introducers' seed, it was a good type of Landreth Extra Early, but occasionally branching, with leaflets sometimes in twos only, flowering lower on the plants (8th node) and more freely, and producing pods averaging hardly as long, but slightly more plump; so that the equally numerous peas are a little larger. No increased productivity could be noted, but Good Luck was a day or two earlier than Landreth Extra Early.

Pedigree First and Best (Ref. 253) was called "the standard extra early pea." It is probably identical with Pedigree Extra Early.

Monarch of Earlies (Ref. 254) appears to have been first cataloged by Isbell in 1906—as a "grand extra early" of moderate height, ripening evenly; dry seed slightly wrinkled.

MINOR VARIETIES OF TOM THUMB GROUP

Dwarf Brittany. Refs. 7-10. Except for a trial of two strains at this Station by Prof. Goff in 1884, Dwarf Brittany may not have been grown in America; but it was early cultivated in France and is still found there. It crossed to England but apparently did not find favor.

Quite similar to Spanish Dwarf, later, ripening over a shorter season, and more prolific for the size of the plants, and with slightly larger, better colored pods.

Early Dwarf. This name includes several varieties, sometimes Bishop Dwarf under one of its true or erroneous synonyms,

As grown here for two seasons Monarch of Earlies seemed intermediate between the Extra Earlies and Marrowfats, having about the same vine characteristics, the earliness and the small seeds of the former, and the long, pointed, often also dorsally pointed, pods of the Marrowfats. The pods filled poorly, making the variety a poor cropper.

Early Dixie (Ref. 255) undoubtedly originated before 1911, as it was then said to be popular with Southern market gardeners; but was not listed by Tracy in 1902. It was an extra early with well filled, light green pods.

Maximus. Refs. 258; letter of Tait, Dec. 18, 1926. Maximus was selected from the old Despot sometime before 1913, as a pea for fall growth in the South. It is a full picking later than the true extra earlies, but makes a profuse setting of broad, very thick pods. It is now superseded.

Mauretania. Ref. 259. Origin unknown, but since the steamship for which it is named made the Transatlantic record in 1910, the variety undoubtedly originated between that year and 1913 when it was cataloged. It may be of English origin, since seed of it was received from British Columbia.

It was described by Leonard as very early, 2 to $2\frac{1}{8}$ feet high, with light green pods $2\frac{1}{2}$ inches long, blunt, and small, white, smooth seeds. It was called a great improvement over First and Best, which it greatly resembles.

As grown here, sown May 22, pods were ready in 40 days, our record; and sown May 1 next year, it was 52 days to first picking. The earliness was joined with very short vines, 10 to 15 inches, and short pods, $1\frac{1}{2}$ to 2 inches, broad, with pointed to rounded ends, which contained 2 to 3 peas to a pod; but the following season gave somewhat taller vines and larger pods. The peas and seeds were larger than those of typical Extra Earlies. The foliage was very scanty and very light green.

From our experience Mauretania is not a promising variety, as the yield of peas was very small through poor filling of the pods. Earliness might commend it.

Blue Ribbon Chieftain. Refs. 260; letter W. P. Stubbs, Dec. 9, 1926. Wood, Stubbs & Co. introduced Blue Ribbon Chieftain about 1913. W. P. Stubbs says it was a selected strain of the First and Best type.

Although a typical Extra Early in nearly all respects, its pods are not quite so blunt as those of most of the group, and are more frequently in pairs, giving a very good yield. The seeds are also more or less mixed with green-skinned ones. The introducer claims dwarfness of plants, deep green color and greater length of pods and greater number of peas to the pod; but these characteristics were not markedly shown in the variety as grown here for two seasons.

Record Breaker. Ref. 261. This strain of Extra Early was "worked up" for fall planting by Williams and listed in 1918, but was discarded as unsatisfactory (letter from sales manager) after two years' test.

Peerless Extra Early (Ref. 262) was described in 1918 as round seeded, absolutely free from runners, $2\frac{1}{2}$ feet high.

Eversure (Ref. 263) was cataloged in 1924 by Galloway as "a grand new pea; a first early, growing 2 feet high, a tremendous yield, withstanding drought very well."

Allan Extra Early. According to a letter from the J. H. Allan Seed Co., Nov. 22, 1926, their many named and unnamed extra early peas are now continued by selecting the best strain and placing it on the market as Allan Extra Early. Dexter, Maud S, Saxonia, Sunol, etc., are among the names thus discarded.

sometimes an introduction with or without its originator's or introducer's name. Some of these varieties came to America but were so indefinitely listed, cataloged and described that it is impossible now to segregate them.

Paxton's *Horticultural Register* (3:207. 1834) describes an Early Dwarf:

Height $1\frac{1}{2}$ to 2 feet, with rather slender, short-jointed stems, small dark green leaves, small tendrils, short petioles, and short peduncles bearing two flowers which produce small, roundish, slightly curved pods. It was "middling" early, a good bearer of peas of good quality changing to very small, white seeds.

¹ A letter from this company, of Nov. 20, 1926, says Triumph was introduced by J. Bolgiano "more than thirty years ago."



Vine and pods of field pea

OPENSHAW

(Nearly natural size)



Stem, leaves, and flowers, large flowers

JOHNSON GLORY

(Two-thirds natural size)

Sinclair in 1839 catalogs under this name what may be the same variety, with the synonym "Six Weeks;" and also lists in 1839 Paris New Early Dwarf. Douglas in 1843 also lists an "Early Dwarf" as "earliest and very productive."

In the *Gardeners' Chronicle* for 1844 (p. 66) Thompson Early Dwarf is advertised; and in 1849 this was tested in the gardens of the Horticultural Society of London (*Journal* of that Society, 4:270).

Height 2 feet, second early, with small round pods containing 4-5 medium sized peas, tolerably prolific, but not equal to Bishop Long-pod. This or another Early Dwarf was described in *Gardeners' Chronicle* for 1850, as bearing small, rather broad pods, usually with five peas, of good quality, very prolific and sometimes flowering at second or third node. It was said to be superior to Spanish Dwarf and to Bishop Dwarf, although *Nain hâtif* and *L'Evergne* are given as synonyms, and the latter is the (mis-spelled) French name for Bishop Dwarf.

Thompson (*Gard. Asst.* 319. 1859) describes an Improved Early Dwarf as really an improvement over his Early Dwarf or Bishop Dwarf because of its greater productivity and larger peas.

Country Gentleman in 1857 and in 1862 gives brief notes on Comstock Early Dwarf:

Remarkably early, with rather large pods containing 6 to 7 peas, and very productive. In the very hot dry season of 1856, this variety, sown on June 2, furnished edible peas in 38 days and matured in 51 days.

The Very Early Dwarf described by Goff in 1884, was said to be "probably *Nain très hâtif à chassis* (Vilm)," a forcing strain of Spanish Dwarf.

Queen of the Dwarfs. Refs. 30; Thorburn *Cat.* 1873; Hogg *Gard. Yr. Bk.* 14:91. 1873. Queen of the Dwarfs was introduced in 1845 by Waite, and later was said to have originated with Dr. McLean, from a cross between Beck Gem and a marrow pea. Tho mentioned in American periodicals much earlier, it was apparently not sold here until 1873. Hogg says it was very tender to cold, subject to aphid and generally unworthy.

It was very dwarf, reaching only $\frac{3}{4}$ foot in height; stem thick, succulent, sometimes branching, and foliage of a dark, blue-green color; pods few, short and broad, giving them a peculiar elliptical appearance, peas only 3 or 4, very large; seed white, egg-shaped and irregularly compressed. It was a poor bearer and late.

Strawberry. Refs. 36, 37. There were evidently several Strawberry peas in America, nearly all dwarf, and poor producers of small, poorly flavored, smooth, white peas; but one strain, said not to be Tom Thumb, grown in 1861, was quite early and full of pods. Some of the strains, Strawberry Vine in particular, were field peas, distinct from Field Creeper.

Peabody. Refs. 38; *Jour. Hort.* 48:380. 1872; *Country Gent.* 38:278. 1873.) When first introduced Peabody was said to be:

Very dwarf, $1\frac{1}{4}$ feet tall and of Tom Thumb habit, branching, with many small bright green leaflets; pods small, rather narrow,

deep green, well filled; peas 6 or 7, small; prolific and late. Subsequent references in both England and America make it $2\frac{1}{2}$ feet tall.

Dwarf Waterloo. Refs. 39, 40; *Gard. Mo.* 16:40. 1874. Introduced about 1866; was said by one observer to be a dwarf form of Royal Victory or Waterloo Marrow; and by another to be a much improved Bishop Long-pod. It was listed in America in 1869, tried in 1874, and called one of the best of the second early dwarfs, a splendid cropper but not equal in flavor to Burbridge Eclipse.

Garden Pride. Refs. 41; N. Y. Sta. *Rpt.* 5:248. 1887; also manuscript notes of this Station, 1886. Introduced by Johnson & Stokes about 1883 and tested at this Station and elsewhere. Since it was not listed by the introducers in their catalog of 1892, it was evidently not a popular pea.

It was very dwarf, stocky-stemmed, 1 to $1\frac{1}{2}$ feet tall; foliage rather deep green, leaflets large toward base of plant but very small toward the tip; pods often paired, short, broad, very plump, pale green, not always well filled; peas rather large, of quality not inferior to Little Gem or American Wonder; seeds were large and nearly smooth. Quite early.

Very Dwarf Cotourier (Ref. 42) was grown in America probably only at this Station, where it was tested in 1884. It is still grown in France.

It was very dwarf and stocky, with exceedingly short internodes, very deep green foliage and very small leaflets, glaucous stipules usually not whitened, pods very pale, very short, plump and blunt ended, quite abundant, produced in midseason, maturing gradually and containing 4 to 6 almost white, roundish, compressed peas and very smooth seeds showing the radicle conspicuously.

Dwarf Prize (Refs. 43, 44) appears to have been listed from 1889 to 1922. It was said to be $1\frac{1}{4}$ feet tall, a stout, productive extra early, ideal for home gardens. The two references may refer to different peas.

McNeil (Refs. 45, 46) originated in Lake City, Fla., before 1891; but came to us from Georgia as Florida McNeil. It is largely grown in the south as a market gardeners' late pea.

This pea duplicates Horal in size and habit of plants, character and color of foliage, size and shape of pods, number and size of peas, productivity and season; but the pods and peas are light in color and the seeds smooth and cream-colored.

Dwarf Rural New Yorker (Ref. 47) was introduced in 1892 by Alexander as a cross between Rural New Yorker and Little Gem, only a foot tall and very productive.

Annonay Very Early. Refs. 48-50. Since notice of this pea was found in an American catalog and it was known to be obtainable, seed of it was secured from France and it was grown here for three years.

It is a typical Tom Thumb in seed, height of plant, abundance and character of foliage, shape of pod, and general appearance of peas; but was somewhat later in season, and the pods were shorter.

Northern Wonder (Ref. 51) was said on introduction, before 1913, to be the finest dwarf, smooth pea yet produced; compact and dwarf in growth, 10 inches tall, early and very productive.

MINOR VARIETIES OF MARROWFAT GROUP

SEEDS WHITE

Rose or Crown. Refs. 27-36; *Amer. Agr.* 28:45. 1869; Cent. Expt. Farm (Can.) *Bul.* 39. 1902; Evans *Cat.* 1904. Rose or Crown, the "Scottish or tufted pease" of Parkinson, long and widely grown as a curiosity, has little real value, but is sometimes used as a field pea. The name Mummy, a synonym of Crown, connects the variety with an unbelievable tale of viable peas found in the dust in an Egyptian vase supposed to be nearly 3,000 years old. (See Grimstone Egyptian.) The lower joints of the stem of the Crown pea are very long, but the upper ones are much enlarged, often flattened (fasciated) and much shortened, so that the paired or clustered flowers and pods are borne at the top of the plant.

One of two quite distinct strains has white flowers and white seeds, approaching the Marrowfats in general characters, altho the pods are shorter and peas smaller; the other has pale rose-colored or, in Painted Lady, bicolored flowers, with gray seeds following peas unpalatable because of rather acrid, wild taste. The plants were usually 5 feet or more tall, gave a very good crop of pods late

in the season for garden peas, and matured about midseason for field pea uses.

The gray-seeded Mummy pea was grown here for two seasons but considered only a field pea.

Lady Finger (Refs. 37, 38, 39) is an old variety formerly grown in England, France and America.

No description of it is available; but De Marly, which it resembles, was a tall pea, $5\frac{1}{2}$ to 6 feet, with straight, plump pods of Marrowfat type about 3 inches long, rather blunt-ended, with the large peas "mounding" the sides of the pod. It was ready to use in late midseason, and not very productive. Seeds white.

Matchless Marrowfat. Refs. 40-44; Lawson *Agr. Man.* 79. 1834; *Gard. Chron.* 344. 1845; 1017. 1859; and 292. 1865; Burr *Fld. Gard. Veg.* 542, 543. 1863. This pea was listed in 1827 in an American catalog; and Lawson says in 1834 that it was recently introduced by Warner.

Height 3 to 4 feet, unbranched; pods straight, 3 inches long, very wide, but plump; peas 6-7, large; seeds compressed, irregularly shaped, sometimes slightly wrinkled, white and olive in color. Later

references, particularly American, make it taller. It bore 12 to 16 pods to the plant, usually paired; very productive, ready in midseason or later.

Milford Marrowfat, advertised in 1841, and Stradsett Marrow, considerably later, at first seemed to differ slightly from Matchless Marrowfat; but in the Chiswick trials of 1860 were considered identical with it. All were said to be disappearing in England in 1865. Matchless Marrowfat and Milford Marrow were described by Burr, but except that the pods of the latter were liable to thin out and shrivel rather than to increase in plumpness when ready to pick, no significant differences between these varieties were noted. They were probably soon superseded by the wrinkled marrows. Matchless Marrowfat is also the name of a wrinkled pea. See p. 100.

Shilling Grotto. Refs. 45-49; Burr *Fld. Gard. Veg.* 547. 1863; Hogg *Gard. Yr. Bk.* 14:76. 1873. Shilling Grotto was introduced about 1843 as a cross between the old Grotto, or Oyster pea, and Early Frame.

It was said in early references to have short, broad pods, but later authorities make the pods $3\frac{1}{2}$ inches long, one-half inch wide, thick-backed and rather quadrangular in form, typically Marrowfat; and the other characteristics of plant and seed place the variety in this group. The pods were deceptive, becoming very plump long before the peas were edible. Hogg says the plants were $4\frac{1}{2}$ to 5 feet tall, single-stemmed, of strong habit of growth.

The described by Burr, Shilling Grotto was probably grown in America only on a limited scale.

The Oyster pea, or Mossy-podded pea, was so called from a roughness of the outer pod similar to that of an oyster shell, often with a dark green incrustation, especially in wet weather, which could be at least partially rubbed off. This was probably some form of mildew or other superficial fungus whose spores found favorable germinating conditions in the rough outer skin of the pod. This pea antedates Shilling Grotto by at least ten years, and is credited to Field & Child, London.

Carolina (Ref. 50) may not be distinct from Large, or Tall, Carolina, synonymous with Tall Marrowfat. The name, alone, connects it with America.

Lawson makes it shorter-vined, shorter-podded and smaller-seeded than the typical Marrowfats of the time; and says it was used as a field pea.

Wellington. Refs. 51; Hogg *Gard. Yr. Bk.* 14:81. 1873. Wellington is mentioned in some American literature as a synonym of other peas grown here; but it probably was not cultivated under its own name. Hogg gives Wellington as a synonym of Victoria Marrow.

Lawson says its seeds were the largest white peas and rather oblong or bean-shaped; otherwise a typical Marrowfat.

Branching Marrow. Refs. 52-58; *Gard. Chron.* 53. 1850. Branching Marrow and Dwarf Branching Marrow have not been recorded in America, except thru synonyms. The variety and its dwarf form were probably not distinct, tho the heights given run from $1\frac{1}{2}$ to 6 feet. Common synonyms connect the two names and a very dwarf form was described under the unmodified name. Both early and late references give figures for a dwarf type; so that the confusion in synonyms can not be due alone to reversion to a taller form. The variety was in cultivation for 30 years, and was of true Marrowfat type, but quite early. It is of interest chiefly as being the pea selected by the unknown originator of the "Mummy" pea hoax. (See Grimstone Egyptian.)

American Marrow (Ref. 65) was 2 feet tall, ready in 110 days from March 28; free and fine.

Monastery. Refs. 68; Thorburn *Cat.* 1847. Dancer's Monastery was advertised in 1845 by Farnes, and was called new in America in 1847.

It was a white marrow pea, 6-7 feet tall, earlier than Tall White Marrow, with large pods in succession, each with 7 to 8 large peas of good quality.

Arrostook Marrowfat (Ref. 69) was said in 1888 to be of true Marrowfat type in vine, free from mildew, and with more or less wrinkled seeds showing cross-breeding; very productive, earlier and more profitable than Champion of England, selling well in market.

Thurston Reliance. Refs. 63; *Gard. Chron.* 761. 1848; Strong *Cat.* 1852; *Cot. Gard.* 25:291. 1861; Burr *Fld. Gard. Veg.* 549. 1863; Hogg *Gard. Yr. Bk.* 14:80. 1873. Tho Thurston Reliance was considered later only a synonym of Victoria Marrow, it was announced as a new variety in 1848 by Thurston. It was probably a carefully bred selection from the older variety. In trials at Chiswick when at least a decade old, it was considered a distinct and useful pea.

Height 6-7 feet, strong and robust in growth, unbranched, flowering from 3 feet to top of plant, with longer, bright green, smooth pods usually single, and more peas to the pod than Victoria Marrow; pods very broad and flat, slightly curved but appearing more so by the long curve of the outer edge.

Princess Royal. Refs. 73; *Amer. Agr.* 23:116. 1864. This was one of Dr. McLean's crosses of Beck Gem and a marrow pea, said to have been introduced in 1860. In America it was said to resist mildew much better than Champion of England. According to Hogg, its pods filled poorly.

It was a second-early or mid-season variety, $2\frac{1}{2}$ to 3 feet tall, with single or sometimes paired large, broad, straight pods, round- or blunt-ended, with rather heavy tips, and containing 7-8 large peas of excellent quality. The seeds were typical large marrowfats.

Great Eastern (Ref. 75) was "inferior to peas resembling the old Marrowfat with which it was compared."

Good Marrow (Ref. 76) was announced in 1862 as new.

Height $4\frac{1}{2}$ feet, peas edible in 8 weeks, of good flavor; pods long and rather narrow.

Erfurt Early Dwarf White Marrow (Ref. 78), according to manuscript notes, was grown at this Station in 1886, from seeds sent by Haage & Schmidt, probably the introducers. It was unlike other Marrowfats in having strongly curved pods borne on short peduncles. Other vine, pod and pea characters were those of the marrows; but lacking seed description, it is uncertain whether it was a wrinkled or smooth marrow.

Short-Straw Marrow. Refs. 79; Landreth *Cat.* 1889; Kans. Sta. *Rpt.* 2:153, 160. 1889. This pea probably originated with Landreth in or just prior to 1889. It was introduced too late to be included in the early pea tests at this Station; and is now not listed.

Stem strong-growing, succulent, 2 to $2\frac{1}{2}$ feet high, often branched, foliage light bluish-green, whitened, with 2-4 leaflets, entire or toothed, and often with a curled or tendril-like tip; pods frequently paired, $2\frac{1}{2}$ to 3 inches long, broad, not evenly filled, peas 4 to 7 of good quality; seeds smooth, yellow. Second-early, ready in 64 days from early sowing or 58 from late sowing.

Giant Podded Marrow. Refs. 82, 83; Johnson & Stokes *Cat.* 1892; *Rural N. Y.* 55:546. 1896. The introducers, Johnson & Stokes, claimed extreme dwarfness for Giant Podded Marrow, which other references sustain, and pods from 7 to 8 inches long, which others found only $3\frac{1}{2}$ to 4 inches. At the Station they were shorter than those of ordinary marrowfats.

California Marrowfat (Ref. 88a) was listed in 1913 by the California Seed Co., but may have been only a strain of White Marrowfat.

Mammoth-Podded Sugar Marrowfat. Ref. 87. Buckbee claims credit for this pea, which originated in 1911; but aside from length of pods (4 to 5 inches), their abundance, uniformity and good color, no separatory characters are given.

These points could not be confirmed from our Station tests of 1925, and the height, 5 to $5\frac{1}{2}$ feet, was decidedly greater than the introducer's figure for the variety. It is large-seeded and the seeds show rather more wrinkling than most other marrowfats, indicating possible better quality, as implied by the name. This point was not tested here.

Early Sugar Marrowfat (Ref. 88) was first listed in America by Moore & Simon in 1907; but the seed came from England. Earliness, dwarfness and profuse bearing were claimed for it, as well as large size and beauty of pods. It is still carried by the introducers; but apparently has not found general favor.

Springtide (Ref. 89) originated with Carter in 1904, from a Telephone x Exonian cross, both wrinkled peas, but giving as progeny this pea of the marrowfat type with pitted or slightly wrinkled, large, light cream-colored seeds. It might be classed also either as Dimpled or as Wrinkled, Cream-seeded.

Height 2 to 2½ feet; stems short, sparingly branched at the base, leaflets in 4s, large, and stipules much larger, sharp-tipped, glaucous and whitened; flowers greenish-white, from 8th node, sometimes paired but the pods rarely so; latter 3 to 3¼ inches long, quite broad, very plump and often saddle-backed, straight or slightly curved, with rather sharp-pointed ends, often dorsally slanted also, with small tips; peas 4 or 5, large, very smooth, round, oval longitudinally, good glistening green in color and of fair quality. In our trials in 1926, from seed grown at McMillan, Mich., Springtide gave a good to very good, early crop.

White-eyed Marrowfat (Ref. 90) seems to be listed in the catalogs of one American seedsman only, Allan. It is undoubtedly more grown as a field pea than in the garden.

As described by Allan its hardy, vigorous vine, 3½ to 4 feet tall, bears rather leathery pods near the top, these being 3 inches long, blunt-ended, and light green in color. As grown in the Station garden for three seasons, from seed raised at the Idaho Station, it was of good marrowfat type, 3 feet tall, flowering at the 11th node and producing quite large pods and peas. When sown May 22, it produced edible pods in 55 days; but from earlier sowings required nearly nine weeks. The crops were only poor to fair. The seeds were rather large, long, approaching oval, and very smooth, whitish cream in color, but without any noticeable whiteness about the eye.

SEEDS BLACK-EYED

Spanish Mullato. Refs. 96-100. This pea, of Spanish origin or coming from Spain to England and France, was of tall, large-seeded, black-eyed type, one of the "leading peas at first tables during reign of George I." With Egg, was "the poor man's pea, being the most hardy and abundant bearers." For a long time in England peas were rich men's luxuries.

MINOR VARIETIES IN ALASKA GROUP

Blue Imperial. Refs. 13-17; Mich. Sta. *Bul.* 131:31. 1896. N. Y. Sta. *Rpt.* 1:87. 1883. Blue Imperial probably came from Blue Prussian, but has larger leaves, stronger growing plants and shorter season. It presumably originated shortly before it was cataloged in America, in 1824, as *Grand Imperial*.

As described a decade later, it was 3 to 4 feet high (with a dwarf form 2 to 3 feet high), unbranched, with short joints; leaves of medium size, dark glaucous green; flowers paired, decidedly greenish, on short peduncles; pods large, dark green, well filled with peas of good quality, changing to light blue seeds, large and somewhat flattened. Ready at the same time (about 110 days) as Blue Prussian but of shorter season; an abundant bearer. As grown at this Station in 1882, and again during three of the past four years, the season was much earlier, 76-79 days; plants 3½ to 4 feet high, vigorous, with internodes of medium length, abundant medium green foliage, slightly glaucous but not whitened; greenish white flowers in pairs at 17th to 18th node on short stocky peduncles; pods 2½ to 3 inches long, of moderate width but plump and well filled, straight, square ended with large straight tips, slightly lighter in color than foliage, and containing 5-7 medium to small, light green peas, round to oval and somewhat compressed; seeds semismooth, greenish blue with a few cream colored, oblong, flattened.

The yields were good to very good, making a very satisfactory field pea. The cooking quality was not tested.

Bedman Imperial (Refs. 17, 18), developed before 1840, and *New Imperial* (Ref. 19), about 1847, were, respectively, better than the parent type, Blue Imperial, and not as good. Both were listed in America, but not much grown. The former (*Jour. Hort. Soc. London*, 4:272. 1849) was more dwarf than Blue Imperial and had slightly curved pods; the latter was taller, later and with small, cylindrical pods.

Imperial Blue (Refs. 20, 21) is allied by descent to Blue Prussian, and by synonymy to other varieties in the Alaska group; but its characteristics seem to place it with the Dimpled-seeded peas, and it is discussed under that group.

June. Refs. 32, 33. A June pea was described, briefly, in 1857 as being larger than the common field pea, earlier, and producing more peas with less straw; and an *Early June*, which is also a synonym of *Early Dwarf* or *Early Washington*, was listed in 1902.

Since seed of *Early June* secured in 1922 from the firm advertising the pea in 1902 was greenish blue in color, it is evident that June and *Early June* are name and synonym, reversibly, of two varieties, one an *Extra Early* and the other of Alaska type.

In the Station tests the green-seeded variety was ready for use in 57 days when sown on April 27th or May 1st, or in 10 days less time when sown on May 22.

Said to be 5-6 feet tall, rather slender in vine, with small, slightly curved, nearly round pods, containing 7 medium sized to large peas, "tolerably good if gathered when young." The seeds were yellow, round, and black-eyed. It was very late.

Nonsuch (Refs. 101, 102, 104), commonly known as *Pearl*, is now grown only as a field pea, often used for "splitting;" and still among the better late varieties for the purpose in Canada. Its history dates far back, and its origin is unknown.

It was originally much like *Tall White Marrowfat*, but with flowers, pods and their stalks smaller and shorter, and with the seeds black-eyed. The seeds themselves were quite large, the pods being thin-walled and compact. It was very late but bore abundantly. Later, the smaller-seeded, shorter-vined strains became more prominent as better suited to field culture, but the season was not shortened.

Peruvian Black Eye Marrow. Refs. 111, 112; N. Y. Sta. *Rpt.* 4:186. 1885, and mss. notes. From any available descriptions, no separation can be made of this variety from the common *Black-eyed Marrowfat*. It is probable that the name merely indicates more clearly an American origin for the smaller-seeded black-eyed peas.

Telegraph (Ref. 113), of marrowfat type, very unlike the dimpled-seeded pea of the same name, originated about 1860, and when tried in the garden of the Royal Horticultural Society was said to be "like *Early Emperor* in all respects, except for black hilum, like Egg;" which would make it a typical black-eyed marrowfat, with rather small, blunt-ended pods. The peas also had the rough, "beany" taste of Egg.

The vines were shorter (2 feet) and slenderer than those of *Earliest of All*, *Nonpareil*, or the *Alaskas*, but similar in other respects; and produced many small white flowers, beginning at the 10th node, borne both singly and in pairs, followed by small pods (2¼ to 2¾ inches) which were otherwise typical *Alaskas*. The peas were of medium size, smooth, round, and could hardly be distinguished from those of Alaska. *Early June* gave very good crops of its small pods; but cannot be specially recommended for either garden or field culture.

Kentish. Seed under this name was sent us from the trial grounds of the United States Department of Agriculture at McMillan, Mich., and it was tested in 1926, proving an inferior Alaska-type pea, taller, with a few basal branches, and single, short, plump pods, 2 to 2½ inches long which wrinkled early. They contained about 5 light green peas that lost color in cooking and were of poor quality. About one-fourth of the seeds were cream-colored. This may be *Kentish Invicta*; but comparison of the two in the United States Department of Agriculture tests in 1928 showed some differences.

Griffin. Refs. 37; *Jour. Hort.* 48:401. 1872. We find no notice of Griffin in America; but include it here as another Laxton addition to a numerous group of Alaska type peas originated by various growers and breeders at about the same time. It was said to resemble the *Frame* peas, with simple stems, 3 to 4 feet high; pods 14 to 16, rather short, generally paired; peas 6 or 7, medium sized, of mottled appearance through mixture of light and dark green; and not well flavored. The same mottling appeared on the small, dark seeds. It was as early as *Sangster No. 1*.

Carter Invicta (Ref. 38) was probably introduced by Carter, and undoubtedly of *Kentish Invicta* type, and so, like *Alaska*. In extensive trials on the grounds of one of the nobility it was called very good but it did not win "highly commended."

First Crop Blue. Refs. 39; *Gard. Mo.* 16:40. 1874. This is another Carter pea, introduced very soon after *Invicta*, quite widely grown in England and tested in America in 1874. It resembled *Burbridge Eclipse*, was 1½ to 2 feet tall, robust, bearing 8 or 9 single or paired, short, broad, slightly curved, blunt-ended, light green pods. It was as early as *Daniel O'Rourke*, of better flavor.

Smilax (Ref. 43), originating with Alexander, about 1885, was apparently of Alaska type, but often branched from the root, giving two 3-foot stems. It was later and more productive than *Alaska*, with paired pods sometimes containing 10 peas which held their green color after boiling. It was not uniform in type.

First and Earliest. Refs. 44; *Rural New Yorker* 41:756. 1885. This was probably the variety in the small packets of the pea later known as Alaska, some of which were sold in Europe by Cleveland, at the rate of \$42 per bushel. As tested in England it was found a day (!) earlier than Laxton Earliest of All, and a heavier cropper; but apparently attracted no attention.

It was not listed in America unless as Alaska.

Express. Refs. 45; Wood, Stubbs *Cat.* 1902; Vilmorin-Robinson *Veg. Gard.* 506. 1920. This greenish-seeded Express is apparently American, as it was first mentioned in a test here in 1884, as Bliss' No. 72. It may have differed from Laxton Earliest of All in longer season, some pods rather small, and slightly larger seeds. It did poorly from seed sent here in 1922 from British Columbia; and this Express was not found in current catalogs, so no recent description was secured. The second reference says it is among the first to mature and has long, straight pods, ripening uniformly and well filled with peas of good quality. The French reference notes its resemblance to Prince Albert, with deep green seeds. It is apparently only another Alaska.

Maule Earliest of All. Refs. 50; Maule *Cat.* 1894. This pea was advertised as a very fine strain of extra early peas, very regular in growth and a good yielder. It was tested at this Station in 1886 but the time of introduction is unknown. As grown here it was found "similar to Philadelphia Extra Early," overlooking the green color of the seeds sown, "but with stems frequently branched medially and with very long pod-stalks." The introducer calls it "an improved strain of Alaska," which could hardly have been true of the seeds tested here, since Alaska itself was then just introduced.

It may have been Laxton's Earliest of All.

Earliest Blue (Ref. 51) was offered by Sutton in 1886, as the earliest of its class and very productive. The medium sized, blunt-ended pods and greenish blue seeds prove it of Alaska type; and the new strain of it, introduced by Sutton in 1915, and grown here in 1924, is a short-stemmed, short- and broad-podded, large-seeded Alaska pea, yielding well. Seed of it has been substituted for that of Alaska without creating comment. It is possibly a day or two later in season and crops longer.

Clipper. Ref. 52; N. Y. Sta. *Rpt.* 6:331. 1888. Rawson introduced Clipper, probably in 1886. Trials proved it identical with Alaska or unlike only by "infinitesimal differences." Sydenham's "The Clipper" is a wrinkled pea.

Advance (Ref. 53), received here in 1887 from the U. S. Department of Agriculture, was found identical with Alaska.

Blue Beauty. Refs. 54; Kans. Sta. *Rpt.* 2:157; Daniels *Cat.* 1892. Blue Beauty is probably an English pea, tho cataloged at about the same time, 1888, by Daniels Bros., and by Henderson. Most of the early records are American.

As grown at this Station in 1888, it resembled Tom Thumb in habit and size of plants and Alaska in shape and size of pods and color of peas. Other records say its vines were shorter than those of Alaska, with bluish green foliage, and that it was two or three days later than Alaska, and very productive.

McBeth Pride (Refs. 55, 56), introduced by Ferry about 1888, was tested at the Indiana and Kansas Stations and found similar to Earliest of All, but more dwarf, two or three days later, and with smaller pods. It soon disappeared.

Sitka. Refs. 57; Landreth *Cat.* 1892. Sitka was grown with Alaska at the Kansas Station in 1889 and appeared very similar, tho identity of the two was not stated, and the next year the pods were held shorter and slightly curved, and crop later. The Landreth seed firm pronounced them the same.

Electric (Ref. 58) was introduced by Dreer in 1898, as a green-seeded pea of the Alaska type, earlier and bearing longer pods.

As grown in tests here in 1922 and 1924 it is a good, uniform Alaska-type pea with rather small seeds, not earlier nor with longer pods, but these are possibly a little better in color.

Searcher (Ref. 59) was put out in 1900, with rather exorbitant claims for earliness, by Selzer.

As tested here in 1922, 1923, and 1924, it differed from Alaska in no marked way, tho it was a little taller, its foliage rather more glaucous, and its stipules larger. It was no earlier.

Rapid (Le Rapide). Refs. 60; Denaiffe *L. P. P.* 1906; Simon-Louis Freres *Cat.* 1922-23. Seeds of this pea are considerably pitted. It was introduced about 1900, probably by Simon-Louis Freres, Bruyeres-le-Chatel, France.

Except for slightly smaller size of plants and pods and rather scanty and lighter foliage, it is a typical member of the Alaska group, most resembling Extra Early Nonpareil. The greenish flowers indicate descent, in a rather more direct line than Alaska's, from Blue Prussian.

Large-podded Alaska. Refs. 61, 62; South Dakota Sta. *Bul.* 91:7. 1905. Large-podded Alaska originated in Ontario, Canada, and was introduced into the United States by Johnson & Stokes in 1903.

As tested in South Dakota in 1904 and as grown here in recent years it is essentially true to its name, altho 3 or 4 days later than Alaska and picking longer. The pod is fully a half-inch longer than that of Alaska, less plump, rounded or pointed at the end rather than blunt or square, the tip much smaller and the peas about the same but possibly of better quality. It is apparently a better market gardeners' pea than Alaska, later, but grown more in the South than in the North.

Long-podded Alaska, apparently first listed by Meyer in 1913, as grown from two sources is more like the above variety than like Long-pod Alaska, but pods are slightly curved at the tip.

Saginaw Valley Pride. Ref. 63. The catalog claims "Earliest pea in America today; ripe in 35 days." This claim and the smooth, blue peas indicate an Earliest of All strain.

Velocity (Refs. 65; Maule *Cat.* 1910) is recorded as grown near Witham, England, and probably was introduced by Cooper-Taber. From several American descriptions dated very soon after its origination, and from its growth here, both in garden tests and as a canning pea, it is a typical but rather dwarf and short-podded Alaska, with pods less well filled and consequently more pointed, and rather smaller peas.

Tho called very early, it proved rather later than Alaska in the field, and was ready at the same time in the garden.

Both Sutton and Hurst have recently announced improved strains of Velocity.

Long Pod Alaska. Refs. 66; Tait *Cat.* 1918. As listed in 1910 by J. Bolgiano this variety was "similar to Extra Early Alaska; but having pods almost twice as long." As grown here for two seasons, not however from seed supplied by the introducer, it proved to be Alaska, the pods being only slightly, if any, longer than typical ones of the common variety.

Other seedsmen give this name as a synonym of Claudit and Ameer of which the seeds are larger and dimpled.

Concordia (Ref. 67), listed and apparently originated by Allan, did not establish itself and was dropped in 1915.

It was like Alaska in habit, pods and peas; but two weeks later; and the abundant pods were at the top of the plants, in these points resembling Horal.

Goodwin Prizewinner (Ref. 68) was listed in 1915 by the Champaign Seed Co., Champaign, Ill., and described as 1½ feet tall, a little later than Alaska, productive and with light green seeds.

"The Hustlers" (Ref. 69) originated with J. Bolgiano and was introduced in 1910. It is said to be a cross between Extra Early Alaska and Long-podded Alaska and to combine the earliness of one parent with the long pod of the other.

It was grown for three years in our recent tests and found to be essentially a tall-vined Alaska, its pods somewhat resembling those of Long-podded Alaska in pointed, small-tipped ends but not equalling them in size. It was not as early as the better strains of Alaska, and not better in yield.

Indianapolis Market (Ref. 71), as listed by Tinsley in 1911, was about 2½ feet high and like Alaska in general habit, but about a week later in maturing and with larger and broader pods, and round, light green seeds, "wrinkled." This latter, with the size of the pods, may make the variety more like Ameer than Alaska.

McLean First of All (Ref. 72) came from England, so is not Henderson First of All; but probably a very productive pea of the Alaska type. It is said to bear sometimes 150 pods to the plant.

Giant Express. Refs. 73; Leonard *Cat.* 1913. Giant Express, blue-seeded, and Giant Lightning, cream-seeded, were

apparently introduced at the same time, about 1910, by Carter. They were real improvements, in size of pods, on Express and Lightning. Giant Express is taller in vine than Alaska, $4\frac{1}{2}$ to 5 feet, with $3\frac{1}{2}$ -inch, rather broad, slightly curved pods. It was brought to America very shortly after its introduction in England; but has not been widely grown

MINOR VARIETIES IN SCIMITAR GROUP

SEEDS CREAM

Banksian Marrow. Refs. 21; Thorburn *Cat.* 1861. In 1860, in trials of the Royal Horticultural Society, Banksian Marrow was considered as practically identical with Scimitar, but straighter podded; but in 1867, ten years after its introduction, was called an improvement on it, without specifying in what respect.

It was listed in America in 1861; but apparently little grown either in England or here.

Etampes Wonder (Refs. 29, 30) was found in a sowing of peas made shortly before 1883 by M. Bonnemain of Étampes, France. It was widely cultivated in France; but not recorded in the United States except for our recent tests of it and one made here in 1884.

It is much like Auvergne, but with longer, decidedly broader pods, holding width nearer to the point, better filled so that the more numerous peas (7-9) are compressed in the pod. It is a mid-season variety, and one of the best yielders of the Scimitar group. The plants in our recent test were about a foot taller than those grown in 1884.

Glory of Cassel (Refs. 31, 32; Hogg *Gard. Yr. Bk.* 14:75. 1873), a pea very much like White Scimitar, was sent to this Station for testing in 1886 by Haage & Schmidt; but an English reference calls it "new" in 1871. Hogg says Glory of Cassel was similar to Auvergne, but inferior to it and two days later.

It was about $2\frac{1}{2}$ feet tall, branched, with medium green, scarcely whitened foliage, with paired pods, $2\frac{1}{2}$ to 3 inches long, usually strongly curved, with rounded to blunt points, very plump, sometimes being thicker than wide, light green in color with marked bloom, and containing 6-8 roundish peas. Pods were ready in midseason and crop rather better than good.

Gold von Blocksburg (Ref. 34) was sent the Station for testing by the University of British Columbia in 1892; but we found no record of it except its listing by Haage & Schmidt in 1899, and its inclusion in Vilmorin-Robinson's *Vegetable Garden* in 1920 as a German variety rather like White Scimitar.

As grown here it was $3\frac{1}{2}$ feet tall, with medium to dark green foliage, the leaflets being very broad. The pods were very similar to those of Petit Pois, but not quite so long nor so slender, and were less well filled because of many abortive peas. The pods became noticeably yellow before ready for picking, the peas yellowish green, and the seeds deeper in color than other cream seeded peas. It was a midseason variety and fairly productive.

SEEDS GREEN

Batt Wonder. Refs. 22; Burr *Fld. Gard. Veg.* 521. 1863; Hogg *Gard. Yr. Bk.* 14:88. 1873; Vilmorin-Robinson, 541. 1920. This pea attracted some attention and caused a dispute in England,

MINOR VARIETIES IN DIMPLED-SEEDED GROUP

SEEDS CREAM

Atlantic (Ref. 78) originated with Alexander before 1885. It had no superior merit over several other peas of its season.

It was about 2 feet tall, with strong stems and healthy foliage, bearing in early midseason about 10 medium sized pods in pairs, containing peas of fair quality, changing to partially wrinkled, probably cream-colored seeds.

Yorkshire (Ref. 100) is evidently distinct from Yorkshireman, Yorkshire Gem, and Yorkshire Hero. Two years' growth of it here, from Idaho Station seed, proved it a very good and typical member of this group. Vine and foliage characters were very similar to those of Sunrise. As with so many peas of this section, the mixed cream and bluish green seeds sown gave much larger crop seeds, quite uniformly good light green.

Height 2 to $2\frac{1}{4}$ feet; stems stout; pods single, from 12th node, 3 to $3\frac{1}{4}$ inches long, quite broad, plump, nearly straight, with rounded to blunt ends; peas very large, long oval or oblong in shape, medium green; seeds same shape with decided indentations and

Earliest Perfection (Refs. 74; Shumway *Cat.* 1922) was listed by Shumway previous to 1902. From his description and figure, and from growth here for three seasons, it appears to be very similar to Market Surprise, but not quite so tall, a day or two later, and with almost dimpled, greenish blue seeds. The leaflets are not quite so uniformly in 4s, and are larger and broader.

is described by Burr, and has been grown in France for some time, being still retained in Vilmorin-Robinson. It was claimed and denied that it came from Woodford Green Marrow, but several years later it was held to be an improvement on that variety.

Burr says it was 3 feet high, robust, with dark green foliage, very well filled, narrow, nearly straight pods and small, round, smooth, bluish green seeds. It stood drought well, and the pods and peas remained long in good condition, even on the vines. It was considered an excellent second-crop pea. Hogg adds that the stem was generally simple, sometimes branched; foliage large, pods paired, curved like those of Scimitar, peas 9 to 11, good-sized.

Blue Sickle. Ref. 23. The *Country Gentleman* in 1862 calls this a very dwarf, early midseason, productive variety, earlier and much more dwarf than Blue Scimitar.

Carter Surprise (Ref. 24; Bliss *Cat.* 1866) is probably a late strain of Blue Imperial with pods of Scimitar type, tho straighter. It was listed in America before 1866.

Evergreen. Ref. 27; Thorburn *Cat.* 1873. Laxton, about 1871, crossed Prizetaker and Advancer to get Evergreen, which reached America in 1873.

It was 5 to 6 feet tall, with rather fine, pale green foliage, and 14 to 16 paired, rather small, slightly curved, blunt-pointed pods, very closely filled with 7 or 8, medium sized, bright green peas, shaded darker; it was in season with Scimitar, but an inferior pea.

Sapphire. Refs. 33; Mich. Sta. *Buls.* 120:24. 1895, and 131:31. 1896. Sapphire was introduced by Northrup, Braslan, Goodwin Co., St. Paul, Minn., in 1892; but is little known, unless in the middle west. The plants, peas and seeds are much like those of Alaska, but of semi-dwarf growth and with curved pods. As tested at the Michigan Station:

Half-dwarf (introducers say 1 to $1\frac{1}{2}$ feet), vigorous, with large, rich green foliage, long curved pods rather unevenly filled, second early, but maturing most of pods very promptly. The peas were of better quality than early-maturing green sorts like Alaska, and the seeds are smooth and "blue." The variety was reported a "good producer."

SABRE SECTION

Blue Spanish Dwarf (Ref. 36) is a very old pea, probably grown in America during the first half of the nineteenth century; but confusion of synonyms of it and Groom Superb make it impossible to say which of the two was meant in several early references. Hogg, 1873, makes it only a synonym of Groom Superb, of which the pod was very slightly, or not at all curved. It could never have been anything but a curiosity, at best.

It was very dwarf, very late, short-podded but fairly prolific as the pods were often paired. The pods were plainly bent *forward*, or sabre-shaped.

coarse wrinkling. It matured late, 66-68 days, and gave a very good crop.

Lye Favorite. Ref. 101. Jas. Lye, Market Lavington, Eng., originated this pea before 1892, when it won a First Class Certificate from the Royal Horticultural Society. It was tried at this Station in 1926 from seed grown in the U. S. Department of Agriculture plats at McMillan, Mich.

It was a good, second early pea, 2 to $2\frac{1}{2}$ feet tall; stems rather heavy, unbranched, very light colored, as were the leaf-stalks; foliage light green, with leaflets in 4s, large, slightly glaucous and stipules much larger, round-tipped, glaucous, whitened; flowers very large, creamy or greenish white borne singly from 10th node; pods 3 to $3\frac{1}{2}$ inches long, broad, straight, pointed or long-rounded at the ends, without tips, and very poorly filled; peas 3 to 5, very large, round, oblong, or almost conical, rather dark green; seed very large, deeply and widely pitted, indented, sometimes almost wrinkled, light cream or almost white in color. Crop good.

Carter International. Ref. 117. International was introduced before 1908 when it was given an Award of Merit by the Royal

Horticultural Society. It is said to be an Early Morn x Duke of Albany cross. When introduced its pods were considered largest of the curved "Marrowfat" type. In America it is not sufficiently wrinkled nor good enough in quality to place it in the class of such peas as Alderman or Duke of Albany.

From wrinkled-seeded parents, its seeds are pitted and indented only, oval in shape, medium in size, and usually light bluish cream in color. Height medium, $3\frac{1}{2}$ to 4 feet, without branches; foliage moderately abundant, green, somewhat whitened and with little bloom; flowers from 14th to 16th node; pods single, on long, thick, stalks; good deep green in color, from $3\frac{1}{4}$ to 4 inches long, generally slightly curved, quite broad, moderately plump, usually not filled to the edge, but filled to the end, which is long-rounded to rounded without a distinct tip; peas 5 to 8, large, round or indented in cross section and oval or oblong longitudinally. The crops at the Station have been produced in midseason, and poor, but in England it is said to bear heavily.

This differs from Hurst International, which was given an Award of Merit at Wisley in 1926 (*Roy. Hort. Soc. Jour.* 52:165, 1927), and is not yet known in the United States.

Frost King (Ref. 118) was introduced by Livingston as a hardy selection from Gradus, earlier because it can be sown earlier, and with more and larger pods. It was apparently a dimpled, cream-seeded pea.

Talisman (Ref. 121) was introduced in 1910 by Sharpe as an earlier and much improved Pilot.

As grown here it was not earlier than Pilot, but the pods were decidedly darker in color, rather smaller but more uniform in size, and much better filled, with much better colored peas. Like so many English peas, it was disappointing in yield, but may improve in this respect. In England the pods are generally paired; but were not in our tests; nor were the peas often more than 5 in number, tho one American introducer speaks of 8 or 9.

Benefactor. Ref. 128. Holmes raised Benefactor and Hurst introduced it prior to 1913. It greatly resembles Welcome, a green-seeded dimpled pea. It was tested here for two years; and found a very early, very good variety of this class.

Plants almost dwarf, $1\frac{3}{4}$ to 2 feet ($3\frac{1}{2}$ feet in England), rather slender and drooping with the very good crop it produced; pods from 6th or 7th node, single, on moderately long, rather slender stalks, about 3 inches long, broad, moderately plump, straight or slightly curved, and well filled both to the edge and the pointed, tipless end; peas usually 5, large, compressed to an almost square cross section, oblong longitudinally, and medium green in color; seeds very large, oval or angular, truly "dimpled," cream to rather dark green in color over dark yellow under-color.

Old England (Ref. 129) originated with Kelway and was introduced in 1913.

As grown here, tall-vined, 4 feet, with some branches; foliage moderately abundant, dark green; crops good to very good; pods long, moderately broad and plump, straight, rather light-colored, with long-rounded ends and small straight tips; peas 5 to 7, large, round or oblong, green to dark-green; seeds medium sized, round to oval, dimpled, indented or somewhat wrinkled and bright cream in color. It was late, requiring for filled pods nearly ten weeks from near the middle of May.

Early Record. Ref. 130. Simon & Son listed this pea in 1915 as "a selection of the rounder seeds from Gradus," that can be sown before Gradus, retains its earliness, and gives more and larger pods. It was listed by the firm for a few years; but dropped later, so was not tested here.

Earliest Springtime (Refs. 131, 132) was introduced about 1915, by F. W. Bolgiano as a round-seeded variety, with very long pods and peas as large as those of Gradus. As grown here from seed twice obtained from the originator it proved a variant type, the two lots showing differences in size, color and amount of dimpling of seeds, similar to those noted on our grounds between dealers' seeds and crop seeds of other dimpled varieties.

Height 3 to $3\frac{1}{2}$ feet, stem decidedly enlarged above, unbranched; foliage medium green, sometimes whitened, of from 2 to 4 large leaflets and very large stipules, rounded at the tip and with few large teeth near the base; flowers single on long, thick stalks, from 14th node; pods 3 inches long, broad, moderately plump, straight, filled to the rounded end, but not to the edge; peas 5 or 6, large, medium-green; seeds of the two strains weighed 90 and 105 to the ounce, the larger size being accompanied, as in Station experience with other varieties, with increased green color and roughened seed coat. The pods were ready before midseason; but the crops were not good.

Johnson Victor (Refs. 133, 134) originated with W. W. Johnson, before 1916, when tested by the Royal Horticultural Society. As grown here for two seasons:

Height $2\frac{1}{2}$ to 3 feet; pods $3\frac{1}{2}$ to 4 inches long, slightly curved, with long-rounded or pointed ends, of rather poor color and not well filled; peas large, quite irregular in shape, medium green; late midseason; crops only fair, not good. English descriptions make the seeds grayish green, but those sown here were distinctly cream, changing to green in the harvested seeds.

Britisher. Ref. 137. In 1918 Kelway sent this pea for testing by the Royal Horticultural Society, but neither in this year nor in two subsequent tests did it receive special commendation.

In our tests it was slightly shorter and more slender in vine than Old England, two or three days earlier, with slightly shorter but plumper pods, rounder ends and larger, greener peas. The seeds also were distinctly larger, with a very decided tendency to become green and more wrinkled. The crop was about the same as that of Old England, possibly fewer pods, but better filled. The pods were rarely or never paired, tho so described in English references.

Morning Glory. Ref. 139. This dwarf and very early pea was introduced in 1920 by J. Bolgiano. As grown here:

Height 2 feet or less; stem slender and drooping, unbranched; foliage moderate in amount, light-green, often decidedly whitened, but with little bloom, with large leaflets in 2s or 4s, and very large round-tipped stipules; flowers single, from the 8th node; pods $2\frac{1}{2}$ to 3 inches long, broad, moderately plump, straight, long-pointed, light colored and poorly filled; peas 3 to 5, very large, round to oval, medium to dark green in color. When sown May 22, in a hot, dry season, pods were ready to pick in 6 weeks, but the crop was poor.

Under moister and cooler conditions when the pods could lengthen and fill, this should be a good, early, market pea.

Warrior. Warrior came originally from Kelway who introduced it before 1920. It is much like Telegraph, but with cream-colored seeds. It was grown here for two seasons, from seed sent by the Idaho Station in 1922:

Stems tall, 5 feet, slender, unbranched; foliage abundant, light green, slightly whitened, with small leaflets in 6s and somewhat larger stipules; pods single, from 13th node, extra long, broad to medium, moderately plump, straight or slightly curved, with pointed or long-rounded ends, not well filled; but when good, they contained 6 to 8 or more large, oval peas of medium green color; seeds of medium size, mostly bright cream in color, round, but much indented, dimpled and wrinkled.

Klondike (Refs. 144; letter Buist, Dec. 15, 1926) was introduced by Buist about 1916, the stock coming from a farmer who had grown it for many years. It many respects it resembles the old variety, William the First, and may be derived from it. It is unlike the more recently introduced dimpled peas, seeming to be fixed in seed-type without the tendency to vary which marks so many others of the group. It was grown here for three seasons.

More dwarf than William the First, $2\frac{1}{2}$ feet; stems slender, sometimes branched; foliage medium in density and medium green in color, with small leaflets in 4s and very large stipules rounded at the tip, both leaflets and stipules decidedly whitened and somewhat glaucous; pods usually under $3\frac{1}{2}$ inches in length, sometimes quite short, moderately broad and plump giving a round-oval cross-section, straight or slightly curved, pointed at the end, usually filled to the edge but not to the tip; peas 5 or 6, very large, round or indented, oblong, dark green; seeds medium to large, cream, much indented, sometimes almost square and widely pitted or almost wrinkled. The pods were ready in early midseason and the crops good.

Johnson Glory (Ref. 134) was sent to Wisley for trial in 1922 and said to have been introduced by W. W. Johnson.

It has been grown at the Station for three seasons, from seed sent by the Idaho Station.

It seems very similar to the old Glory (Gilson's), rather shorter in vine, darker of foliage, slightly longer podded, with larger peas and slightly larger seeds. Though sown at different dates it appears to be of the same season as the older variety, a second or third early. It gave fair to good crops.

SEEDS GREEN

Tall Green Marrow (Refs. 1-5) is distinct from the Tall Green Wrinkled Marrow bred and segregated by Knight. Knight's Marrows were all truly wrinkled peas, but this had only compressed and very slightly wrinkled seeds, probably close to our dimpled peas. It was described, with numerous synonyms, in 1834, and again at

various intervals until 1865 when it was said to be disappearing. It probably never reached America.

Very tall, 7 feet, of strong growth; pods large; broad, rather flat, dark green; peas 8 or 9 large, green; seeds yellowish green. It was prolific but late.

Improved Green Marrow (Ref. 6), advertised by Farnes in 1842, may have come from either the preceding or the following variety.

The height, 4 feet, is the only characteristic given.

Early Green Marrow. Refs. 7; *Jour. Hort.* 1:29. 1861. U. S. Pat. Off. *Rpt. (Agr.)* 1865. As described in 1834, this "early" pea, sown near the last of March, required nearly four months to mature; so differed but little in that respect from Tall Green Marrow. It was listed in the United States in 1865.

Shorter vined, only 4 feet, and bore paired pods, which, however, were shorter, plumper, and better filled, as well as slightly curved. The seeds were mixed cream and green. In 1860, it was found to be taller, 7 feet, and much like Prizetaker, a newer variety, with smaller pods and "in every respect inferior."

Bellamy Early Green Marrow. Refs. 13-17; *Hogg Gard. Yk. Bk.* 14:83. 1873. An early Green Marrow, with dark glossy pods, evidently not the same as the peas of that name previously described, was advertised by Frederick Warner in 1846 and mentioned again in 1847 as Green Wrinkled Marrow. This was followed by Bellamy Early Green Marrow, advertised by Sutton in 1849, which probably was an improvement on one or the other of the two early Green Marrows, and possibly related to the old Matchless Marrowfat. It seems to have been the ancestor or predecessor of Prizetaker and Rising Sun, and was, on their advent, considered inferior to them. Hogg gives the name only as a synonym of Prizetaker.

Height about 5 feet; much earlier than the tall marrows previously known; with long, narrow, slightly curved pods, quite distinct from earlier types, containing 7-8 large, compressed peas, which were of decidedly improved quality. It may have been a truly wrinkled variety, but the synonymy would imply only dimpled seeds, white and olive green.

Large Green Normandy (Refs. 25, 26) was tested and described at this Station in 1884. It is an old French variety grown to some extent in England, and said to be allied to Tall Green Mammoth. The early Station description makes it much like the early marrows:

Height about 5 feet; stem strong; foliage deep green; pods often paired, short, plump, slightly curved, round ended and occasionally constricted between the peas (lomentlike) so that the latter were much flattened, tho large; seeds very large, oblong and somewhat indented, bluish white or creamy white in color. It was very late and moderately productive.

Denyer Prolific Green Marrow. Refs. 34, 35; *Hogg Gard. Yr. Bk.* 14:85. 1873. This variety is synonymous with others essential in the history of the type. It was probably a temporarily better strain of Tall Green Marrow, developed by Wm. Battle, Sussex, Eng., about 1855, more prolific than the parent strain, possibly a few days earlier and with peas of better color. It lasted only ten years or so. Hogg makes it synonymous with Garbutt Amazon.

Rising Sun. Refs. 36, 37; *Country Gent.* 18:174. 1861; *Thorburn Cat.* 1876; *Hogg Gard. Yr. Bk.* 14:72. 1873. Rising Sun, advertised in 1856 by Flanagan, was only 3 feet high, early, and with dark green pods; but was probably only a good strain of Bellamy Early Green Marrow. It was listed by American seedsmen from 1861 to 1876. According to Hogg, Rising Sun was a synonym of Early Emperor, cream-seeded.

Garbutt Amazon (Refs. 38, 39; *Hogg Gard. Yr. Bk.* 14:85. 1873) was, like the last, a Flanagan pea, appearing in 1857, and possibly earlier than similar varieties. It was a strong, robust grower 5 to 6 feet tall, unbranched. The irregular seeds were cream and olive. Tho well known in England, it apparently never reached America.

Leicester Defiance (Ref. 42), probably introduced by Harrison (2), was considered in 1861 merely a synonym of Beck Prize-taker. It was still listed by the introducers in 1887. The name was known in America only as a synonym.

Berkshire Hero. Refs. 43, 44. Sutton, in 1859 gave William Culverwell, Taunton, as originator of Berkshire Hero, thus intro-

ducing a commercial breeder who contributed very many varieties to England's long list of peas, but who was comparatively unknown outside a narrow circle. No American references to the variety were found.

It was "like Tall Mammoth in growth, British Queen in seed." It was taller, if anything, than Tall Mammoth, late, with very large pods, containing 7-9 large peas or large, slightly indented (British Queen's seeds were truly wrinkled) grayish olive or yellowish white seeds.

Competitor (Refs. 45-47) was introduced about the same time as Berkshire Hero; and may have been identical with it; as several descriptions are the same and it is made a synonym of the same varieties. Hogg, 1873, considers it the same as Tall Green Mammoth. The Horticultural Society descriptions, however, make Competitor earlier than Berkshire Hero, shorter-vined, with fewer pods which contain fewer peas and are straight and cylindrical instead of long and slightly curved. Competitor was listed in America in 1861. This pea described under this name in Denaisse's *Les Pois Potagers* with the synonym Surprise, is much closer to Eight Weeks than to Competitor.

Noble Early Green Marrow (Ref. 48) is described by Burr, altho it may not have been grown in the United States. It was a sub-variety of Bellamy's pea of the same name, and a much more abundant bearer of very uniform pods.

Royal Blue. Ref. 49. Harrison (1) originated Royal Blue and distributed it in 1864, mainly because of its curious appearance, lack of bloom giving stems, stipules and pods a peculiar green color. It was 3 feet tall, with pods and peas typical of the group, a poor producer of peas of inferior quality.

Challenger. Refs. 71, 72; *Gregory Cat.* 1878. Carter's own Telegraph-like pea, Challenger, was advertised side by side with that variety; but seems never to have acquired wide distribution or popularity. Its origin is unknown. It was offered in England and America simultaneously; but we find no record of its actual growth here except in the test by Prof. Goff in 1884.

Spoken of as dwarf in England, here it grew as tall as Telegraph, had a very large angular stem branched at the base only, pale, yellowish green foliage almost bloomless and somewhat whitened, pods very similar to those of Telegraph, but more tapering, lighter in color, with about one less pea to the pod and these of rather poor color. It was only moderately productive, rather late and matured slowly.

Gladiator (Refs. 77; *Henderson Cat.* 1892) is probably a Laxton pea. It received a First Class Certificate from the Royal Horticultural Society in 1882 and was advertised by Veitch (1) in 1883. It reached America in 1892, but has never been widely grown. It is an improvement on Fillbasket and more dwarf, bearing a very good crop in midseason.

Height seldom over 2 feet; pods long, moderately plump, slightly curved, smooth, good green, pointed or rounded at the ends, well filled; peas 6 or 7, medium sized, oval to oblong, light to medium green.

Kenilworth (Refs. 81, 82; *S. Dak. Sta. Bul.* 85:5. 1904), one of the parents of Early Bird, is said to be similar to William the First, late, taller than Advancer, a good bearer, but not of as good quality. It was grown for a test in South Dakota, but seems, otherwise, to be unknown in America.

Green Noyon (Refs. 83; *N. Y. Sta. Rpt.* 3:259. 1885) is probably of Blue Prussian habit. According to Hogg, it might better be placed in the Alaska group, as he says the peas were small, round, smooth and light green.

As tested here in 1884, was 2½ feet tall, branched, stocky-stemmed; with deep green foliage; very productive but very late; pods short, narrow, very plump, light green, with rounded ends; peas oblong or compressed, whitish green; seeds dull pale green or bluish, with some cream or almost white, all slightly oblong and shallowly dimpled.

Dwarf Green St. Michael (Ref. 84) is known only thru a test at this Station in 1884.

It differed from Green Noyon in being shorter in vine, with shorter pods, and fewer peas, slightly earlier and maturing promptly, but less productive.

Early William (Ref. 93), introduced about 1886, was credited to Laxton, and said to be "an early, dwarf William the First."

As grown here from French seed, it differed only a little from the older variety, altho the seeds were more definitely green. It was not earlier, nor shorter-vined, nor were the pods as good as those of William the First. It seems hard to keep true to type.

Imperial Blue. Refs. 20, 21, in Alaska Group, and 94 in this group. Imperial Dwarf Blue is mentioned in connection with Blue Imperial; but seeds of the former variety from the Idaho Station were very different from those of Blue Imperial. In our tests, Blue Imperial, from the same source, corresponds much more closely to descriptions of Green Prussian, and Imperial Blue to the old accounts of Blue Imperial, which is generally said to have large, rather irregular seeds. The name Imperial Blue appeared in America first in 1869 as that of a Canadian field pea, and the variety is now mainly used for stock feeding. It has greenish flowers, indicating its descent from Blue Prussian.

Plants of Imperial Blue are of typical dimpled pea type; stems stout, 4½ to 5 feet, unbranched; foliage abundant, dark green, with leaflets in 6s, rather than in 4s, large and whitened and the stipules very large; pods in pairs, begin high on the stem, 19th node, on large, heavy stalks, of the Glory, Pilot and Leader type; peas few, averaging 4, and large, broadly oval or oblong, flattened, and of medium green color; seeds above medium in size, oblong in shape, distinctly marked with large shallow pits, or dimples, and light, bluish green in color. The crop was very late and the pods ripened gradually giving a very good yield. Tho not tested, the peas should be of fair quality.

May Queen (Ref. 103), first listed by Moore & Simon about 1901, was not well enough described to identify it. It is possible that this is Sutton May Queen, placed in the Gem group.

As grown here it is undistinguishable from Claudit in the field, except that it flowers lower on the stem, 8th instead of 12th node, has very slightly longer pods, and fewer peas, making these somewhat larger. The seeds vary a little more in color and are perhaps more wrinkled. Season and crop production appear the same.

Dwarf Green Wrinkled Marrow. Ref. 104. This exceedingly dwarf dimpled pea has been listed by Griffith & Turner since about 1901.

As grown here: Less than 1 foot tall; stem stout, sparingly branched at the base; foliage abundant, dark green, with large leaflets, slightly whitened, often only in pairs, and somewhat larger, considerably whitened stipules with sharp tips and very fine sharp teeth almost from base to tip; flowers single, on short, thick stalks, from 6th node; pods usually more than 3 inches long, rather broad, moderately plump, slightly curved and ending in long points without distinct tips; peas 5 or 6, very large, oval to oblong, dark green; seeds of average size, oval or oblong, indented and somewhat broadly pitted or dimpled, occasionally wrinkled, cream and light grayish green in color. Pods are ready in early midseason; but the crop is only fair.

Sunrise Blue (Ref. 114) was sent to France by Carter and may have come to America; but has never been widely grown, even in England. It is quite dwarf, with rather short, straight pods, and distinctly dimpled seeds. It is called early but probably only because it can be sown early; since it required 120 days to mature.

Wonderful Extra Early (Ref. 115), later Wonderful, was introduced to a few growers in 1906 and regularly in 1908 by Schultz.

It was described as a dimpled pea like Pride of the Market, with slightly curved pods having rounded tips.

As grown here it was decidedly early, rather tall, and branched; bore its cream-colored flowers high (12th node and above) singly and in pairs, on long stalks; and produced long (2¾ to 3½ inches) nearly straight, blunt to square-ended pods, with very small tips. The peas 5 to 8 in a pod: were of medium size, round and whitish green in color; and the medium sized seeds were sometimes distinctly dimpled and colored as noted above.

It may be the same as Schell's Wonderful, described elsewhere p. 50, but seeds are smaller, hardly as much dimpled nor as green.

Grand Monarch. Refs. 116; letter from Forbes. This pea, sent out as new by Noll about 1907 and carried by this firm and its successor for many years, was discontinued because considered identical with Ameer. It is still listed by at least one other American seedsman and was grown here for two years before its similarity to Acquisition and Ameer was noted.

Vanguard (Refs. 122; Rice Cat. 1922), "a blue-seeded Pilot," was offered in 1910 by Sharpe. In 1922 seed of it was received here for testing, and it was also cataloged about the same time by a New York State seedsman.

It is of medium height, rather early and a fairly productive variety with long, but rather poorly filled pods, medium green peas and distinctly wrinkled, gray-green seeds.

Another Vanguard will be found among Wrinkled, Cream-seeded peas.

Twentieth Century Giant. Ref. 123. Tinsley listed this "novelty" in 1911, originated "by most careful expert work of selection for a number of years." It was of the Ameer or Claudit type, nearly a week later than Alaska, with long, round-ended pods, broadest one-third of the way from the tip.

Early Marvel (Refs. 126) was announced in 1913 by Weeber as a "valuable introduction; first and best of all round-seeded varieties;" and said to have pods of Gradus type, often paired, and with deep green peas. The seeds were probably dimpled.

Eldorado (Ref. 127) is a dwarf, dimpled-seeded pea with large, dark-green, pointed pods, like those of Pilot but with green seeds. It originated with Sharpe about 1913, and reached America about six years later. It was discarded by at least two seedsmen about 1923 as inferior to Acquisition and other peas of its type.

Was grown here in 1926 from seed raised at McMillan, Mich., less than a foot tall, with widely varying pods, often short, but broad, long rounded at the ends, with 4 to 6 large peas.

Despatch (Refs. 135, 136) was offered by Burpee in 1917.

It is perhaps more a pitted than a dimpled-seeded variety, but the large, straight, pointed to long-rounded pods and large size of peas and seeds and the deep pitting and slight dimpling of the latter remove it from the Alaska group. As grown here it was about 2 feet tall, with rather light-colored foliage, single-podded from about 6th to 8th node, almost as early as Alaska in season, but not specially productive.

Councillor (Ref. 142) was announced as new in Kelway's 1922 catalog, but must have originated earlier, as seed of it was received here in that year from the Idaho Station.

It was dwarf, with compact, bushy plants having a somewhat peculiar appearance due to the closely set leaflets in 6s, and the prominent tendrils; pods usually paired, not large, 2½ to 3¼ inches, neither specially broad nor specially plump, very slightly curved, with long-rounded, tipless ends; peas 6 to 10, medium sized, indented, sometimes almost short-cylindrical, of medium color; seeds small, 168 to the ounce, short-cylindrical in shape, indented, and slightly dimpled, greenish cream and light cream in color. The pods matured in midseason, but the crops were not specially good.

Tiptop. Ref. 143. This was listed in 1922 by Kelway, but as tried at Wisley in 1925, it was credited to Cullen. It was given an Award of Merit. Seed of it came to us from the Idaho Station. Satisfactory descriptions of the plants and pods were not secured, but pods were ready in 52 and 57 days respectively, from moderately late and moderately early seedings. In U. S. Department of Agriculture tests in 1928 it was the earliest pea noted.

As studied and described at McMillan, Mich., in 1925, in U. S. Department of Agriculture plats: Height 2 to 2¼ feet, slender-stemmed; foliage sparse, light-green, of small, broadly oblong, slightly whitened or yellowed leaflets in 4s, and slightly larger, much whitened stipules; flowers above 9th node; pods single, 3 inches long, on medium long, slender but rigid stalks, fairly broad, straight, with very long rounded ends, the dorsum having a distinct long notch near the tip; peas 6, crowded; seeds almost round, smooth to semi-smooth, with a few deep pits, and light green in color. Very early, but crop data not secured.

Welcome (Ref. 146) was developed by Hurst for Continental trade, where the smoother peas are in demand; but this variety and Ajax, grown for the same purpose, attracted so much attention in the trial grounds because of their large crops that both were included in the English edition of the Hurst catalog of 1923. Welcome was called an early William the Conqueror, the latter being an improved William the First.

As grown at this Station, it was 2¼ to 2½ feet tall (half its height in England); pods only 2¾ to 3 inches long, narrow but plump, slightly curved, with pointed to slightly rounded ends, dark green, well filled; peas 5-7, rather large, indented or almost square, oval, very well colored; seeds light green, of almost the same shape as the peas, but much smaller, heavily pitted or almost wrinkled. Very early for a dimpled pea; very productive.

Mammoth Extra Early (Ref. 147), entirely distinct from Mammoth-podded Extra Early, was cataloged in 1922, perhaps earlier, by Alnce.

Height $4\frac{1}{2}$ feet: stem slender, sometimes branched at the base; foliage dense, medium to dark green, with 5-6 small leaflets and stipules not much larger, both scarcely whitened; flowers large, in pairs from the 8th to the 10th node; pods paired, intermediate in size between those of Alaska and those typical of the dimpled seeded group, with pointed to round ends, fairly well filled; peas 4-5, medium sized, oval, somewhat indented and medium green in color; seeds, like the pods, intermediate in type, and green in color. It is an early midseason variety producing only fair crops.

Ajax (Ref. 151), like **Welcome**, was developed by **Hurst** for Continental trade; and listed in the firm's English catalog for 1923 because of its profuse podding. It is decidedly later than **Welcome**, a better cropper for the size of the plants, and can be grown in closely spaced rows.

Very dwarf, less than a foot tall as grown here ($1\frac{1}{2}$ feet in England), with rather better pods than **Welcome**, curved at the point, much darker in color, and as well, if not better filled with peas, which are more oblong and also better colored.

Hartner Early Market (Ref. 152) was listed by the **Western Seed Co.** in 1923 as a very early medium height variety, with typically dimpled seeds; but according to letters from the introducers, it is only **Pilot**, renamed; and **Hartner Miracle**, a pea from the same company, grown for some years in the **San Luis Valley, Colo.**, and tested at **McMillan, Mich.**, is also closely related to **Pilot**.

MINOR VARIETIES IN WRINKLED, CREAM-SEEDED GROUP

VERY DWARF PLANTS

Mighty Atom (Ref. 3), "raised" by **Dicks**, was tested by the **Royal Horticultural Society** in 1921, and later listed by at least two English seedsmen. It was grown here and in the **U. S. Department of Agriculture** plats at **McMillan, Mich.**, in 1924 and 1925, but is probably not yet sold in this country. It is decidedly better than **Minimum**.

Very early, somewhat taller than **Minimum**, darker in color both of foliage and pods, and producing many straight, pointed to long-rounded pods containing about 8 very large, closely packed, bright green peas of good, but not the best, quality. The seeds are sometimes more dimpled than wrinkled.

Perfect Early. Refs. 6; letter from **Isbell**, Jan. 27, 1927. **Isbell** introduced **Perfect Early** in 1914 and still lists it; but it is not generally cataloged. It was based on several plants selected from **Nott Excelsior** as having much larger pods.

As grown here it is almost as dwarf as **Harbinger**, a day or two later, not quite as good a cropper, but with decidedly longer, "stocky" pods, rather better colored and with larger peas of not quite as good quality. The rather larger seeds never show green as do those of the parent variety.

Acacia. Seed of this peculiar little pea came from the **U. S. Department of Agriculture** plats. It was used by **White** in breeding work at the **Brooklyn Botanical Garden** in 1917, three strains of it having been secured from **Bateson of England** and **Vilmorin of France**. Our systematist believes it is a reversion to a very early type, as it is distinct from all other varieties known to us in having no tendrils but with leaflets replacing the tendrils, so that all leaves above one or two at the base consist of 4 full pairs and a terminal leaflet, very small, closely set and medium green in color.

Height seldom exceeds a foot; pods, usually single, from 3rd node up, on long, slender stalks, usually $2\frac{1}{2}$ to $2\frac{3}{8}$ inches long, occasionally straight or slightly curved at the tip, plump, blunt or square-ended, with a rather large tip, well filled; peas averaging more than 5, medium-sized, medium green, which color is held or even deepened in cooking, not sweet, but only poor to fair in quality; seeds well wrinkled. It is a midseason pea, giving very good crops for such small plants.

DWARF PLANTS

White Gem. Refs. 9, 10; *Rural N. Y.* 25:69. 1872; *Vick Cat.* 1875. **White Gem**, or **Nutting No. 1**, was introduced by **Carter** about 1870, and soon reached America. It was very little grown here, as it was found in but one American catalog, and there under the synonym.

American references say it was only 4 days later than the earliest varieties of the time; height $1\frac{1}{4}$ to $1\frac{1}{2}$ feet; pods large, plump, slightly curved, round or blunt-ended; peas of medium quality; very productive. **Hogg** adds that it was robust and vigorous, with pale green, whitened foliage and paired pods borne low

Jubilant. Ref. 153. **Henderson** introduced **Jubilant** in 1925; so it is hardly old enough to have had fair testing. In our plats, however, it has not done well, failing to produce many pods.

It is not striking in any of its plant characteristics, but starts flowering low on the stem and the pods are large, $3\frac{1}{4}$ to $3\frac{3}{4}$ inches long, medium in breadth, plump, straight, pointed or rounded at the end, well filled with 5 or 6 very large peas and of fairly good color. The seeds are of moderate size, round or oval, not often compressed but well dimpled.

Wonder of Holland was noted in the **U. S. Department of Agriculture** plats at **McMillan, Mich.**, in 1925 and was grown here in 1926 from seed secured there.

Nothing of its history has been learned, but it seems a very distinct variety.

Seeds small, not larger than those of **Alaska**, but deeply and closely pitted, compressed and indented lengthwise of the pod, and sometimes also dimpled, approaching **Horal** and **Rogers Winner** in appearance, and distinctly bluish green in color, occasionally cream; very dwarf, 1 foot at **Geneva**; foliage dense, very dark green, not whitened either on the small leaflets or much larger stipules; flowers low; pods paired, $3\frac{1}{8}$ to $3\frac{5}{8}$ inches long, narrow but very plump, rounded at the end and with distinct large tip; peas average 5, small, oval and indented, and medium green in color, not of very good quality. It is an early midseason variety, yielding well.

on the stem, containing 6 or 7 large, whitish green peas, or large, white, wrinkled seeds.

Earliest Table Marrow. Ref. 11. Seed of this variety, listed as new by **Rennie** in 1917, was received at the Station from the **University of British Columbia**. It was very early and gave very good crops.

Good dwarf variety, height $1\frac{1}{2}$ to $1\frac{3}{4}$ feet; pods medium length, straight, square- or protuberant-ended, plump, light green, well filled; peas large, light to medium green, of fine quality; seeds very attractive, bright cream, finely wrinkled.

Germania. Ref. 12. **Thorburn** includes **Germania** among novelties in 1909 but does not give its origin. It was not found in recent **United States** catalogs, but seed of it was received from the **University of British Columbia**. It is one of the earliest wrinkled-seeded peas.

Taller than **Harbinger**, 2 feet; pods light green, averaging longer but not as well filled; peas large; seeds beautifully wrinkled, but varied markedly in color, those sown being all clear cream without green and those harvested light, dull green with rarely one showing a cream tint. Crops not quite equal those of **Harbinger**.

Vanguard. Refs. 13; *Amer. Agr.* 33:103. 1874. **Nelson's Vanguard**, from **Sutton**, was grown by the **Royal Horticultural Society** in 1867, but received no award; and in other English trials was ranked as very good but not among the best. It was noticed in America in 1874, but was evidently little grown.

It was described as a white, wrinkled marrow, $1\frac{1}{2}$ feet tall, earlier than **Alliance**, which is called third early, prolific, but with small, poorly filled pods. It is not at all like another **Vanguard**, a green-seeded, dimpled pea.

Nabob. Refs. 17; *Country Gent.* 38:278. 1873; *Hogg Gard. Yr. Bk.* 14:77. 1873. **Nabob** was a **Laxton** pea, originating prior to 1872 as a **Little Gem** x **Prolific Long-pod** cross. The original description was reprinted in America, but **Nabob** may not have been grown here. It was said to be the "largest and best early dwarf white-seeded variety."

Plants $1\frac{1}{2}$ to 2 feet tall, strong, robust; foliage heavy, dark green; pods long, curved, shorter necked and rounder ended than those of **Auvergne**, deep green in color; peas 7-9, medium-sized, pale green. **Hogg** says it was very productive.

Referendum (Ref. 18) was called new in 1919 by **Kelway** and probably has been grown in this country only at this Station and on the **U. S. Department of Agriculture** test plats. It was not quite uniform as grown here, and plainly was not acclimated as some of the plants lacked vigor; but otherwise it was an excellent dwarf variety.

Much like **Chelsea Gem**, about as tall, with less abundant and lighter colored foliage, a day or two earlier; pods of similar shape, slightly longer, rather lighter in color, very plump, with pointed ends; with more and larger peas; seeds somewhat less wrinkled. The first crops were not quite as good as those of **Chelsea Gem**, but

with acclimated stock should be better, as the variety is said to be extraordinarily prolific in England.

Allotment Holder (Ref. 19) is quite similar to *Referendum*, and was listed by Kelway at the same time, 1919. Allotment Holder seemed more uniform in type, of good vigor and gave good to very good crops. This may be an old variety renamed.

It is slightly more dwarf than *Referendum*, a day or so earlier, with vines somewhat more of the Daisy type, rather "bunchy" at top through slow unfolding of upper leaves, with rather more abundant foliage; pods decidedly longer, $3\frac{1}{2}$ to 4 inches, straight, broad, only moderately plump, not as well filled, with similar pointed ends, the dorsum also often sloping to the tip, not so attractive, tho longer and broader; peas 5 to 8, large, medium to dark green, more or less oval or oblong and frequently indented; seeds not quite as large as those of *Referendum* but equally wrinkled.

Melting Marrow (Ref. 27) was brought to America by Henderson in 1905 as "one of the best of the recent English introductions;" but was not found in English pea lists. American seedsmen, who have handled both, consider it practically indistinguishable from some of the varying strains of *Sutton Excelsior*.

Seeds, from British Columbia, and the crop seeds from them, were cream with only slight admixture of green (not as marked as in most strains of *Sutton Excelsior*); pods straight, those of *Sutton Excelsior* slightly curved; so the variety is treated as distinct and mentioned here. It gave good to very good crops, ready with New Era, but pods were by no means as well filled as those of that variety.

Early Giant. Refs. 30; S. Dak. Sta. *Bul.* 85:5. 1904. Sutton's Early Giant, introduced in 1896, was above medium height in England; but in America, particularly at this Station, was dwarf, seldom reaching 2 feet in height here, $2\frac{1}{2}$ to 3 feet elsewhere.

Flowers from 7th or 8th node up, on long, slender stalks; pods $3\frac{1}{8}$ to $3\frac{1}{2}$ inches, broad, not very plump, straight, very long pointed, often with dorsum also sloping, and poorly filled; peas few, 2 to 4, very large, oval oblong and light colored, as were the pods. The small percentage of peas to pods and moderate crops, not better than good, condemn the variety for America, altho it is reported as doing somewhat better in other tests. It was second early.

Sutton Seedling. Refs. 31; S. Dak. Sta. *Buls.* 85:5. 1904; and 91:8. 1905. Culverwell originated this pea, introduced by Sutton in 1895. It was grown at the South Dakota Station in 1903 and 1904 and at this Station recently. It was neither quite as early nor quite as dwarf as described by Sutton, but would be called a dwarf second early.

Pods 3 to 4 inches long, very slightly curved, with long-rounded ends carrying small tips, poorly filled, and light, bright green; peas large, light green; seeds large, oblong oval, flattened, rather dull cream. The crops were poor.

Crown Prince (Ref. 42) originated in England with one of that country's (unnamed) "famous hybridizers," and after widespread trial in 1895, was introduced in 1896 by Johnson & Stokes. It was said to be very dwarf, but at the New Jersey Station in 1898 was $2\frac{1}{2}$ feet tall, medium late, with pods 4 inches long and very broad. Of 30 varieties, it gave the best yield of pods, but these filled poorly. The very favorable reports received from the introducers' trial packets seemed to warrant the claim that Crown Prince usually gave 7 to 8 peas to the pod and "eclipsed Stratagem, Telephone and others of its class in both quality and productiveness." The blossoms were largely toward the top of the plants. A French authority calls it an American pea, so the entire stock was probably sent to this country; and says it resembled *Eugenie*, cream-seeded. This explains its inclusion in this group. Perhaps it might better be placed in the Large-podded Dwarf group.

White Prolific Marrow. Refs. 43; Gregory Cat. 1890. This pea was introduced in 1884 by Sharpe and reached the United States in 1890; but has never been extensively grown here.

It was 2 to $2\frac{1}{2}$ feet tall, with an abundance of long, straight, paired pods, well filled, ready in late midseason. Seeds were wrinkled.

Sweet Market. Ref. 44. Vaughan introduced Sweet Market in 1900, and it is probably an American pea. It is called second early, but with us, at McMillan, Mich., and in South Dakota, it was not ready until late midseason or after.

Height often $2\frac{1}{2}$ feet, but in the dwarf class, the stout stems, rarely branched, holding the plants quiet erect; foliage abundant, dark green; pods often paired, from 11th node, or higher on tall

vines, $3\frac{1}{8}$ to $3\frac{5}{8}$ inches long, quite broad, plump, straight or slightly curved, blunt ended without distinct tips, of good green color, not specially well filled; peas average about 5, very large, light green, oval, oblong and compressed, of better than good quality, tho hardly very good; seeds very large, quite irregular and well wrinkled. The crops have not been especially good, poor filling of the pods counterbalancing their pairing.

MEDIUM HEIGHT PLANTS

Vick First Choice (Ref. 45) was listed, without special notice, in the 1920 Vick catalog, was overlooked and not tested here. This is probably not the First Choice of Livingston, a dwarf, *Stratagem*-like pea.

The introducers claim it is very early semi-dwarf (3 to $3\frac{1}{2}$ feet tall), very prolific, with large, rich, dark green pods, containing 7 or 8 peas "having all the delicious sweetness of *Gradus*." The seeds are white and wrinkled.

Wonder Worker. Ref. 46. J. Bolgiano lists *Wonder Worker* (sometimes *Workers*) in his catalog of 1906, and the variety from this seed has been grown at the Station for three seasons, while seed also came to us from British Columbia under the name *Bolgiano's Wonder*. This is apparently the same variety, like it in most points, altho the seeds were fully one-half larger and the crop 10 days later. Neither the Baltimore nor the Washington *Bolgiano* firm lists a *Wonder*.

Height $2\frac{1}{2}$ to 3 feet, foliage of Alaska-type, occasionally with a basal branch; flowers from 9th node; pods occasionally paired, of Thomas Laxton type, $2\frac{7}{8}$ to $3\frac{1}{8}$ inches long, better developed and plumper, more uniform, but slightly lighter in color, with a beautiful bloom; peas average about 5 to the pod, not of very good color, quality probably not as good; seeds smaller and usually without the green that shows in Laxton. Crops good, only.

McLean Wonderful. Refs. 47; Vick Cat. 1869; Hogg *Gard. Yr. Bk.* 14:99. 1873. This Wonderful originated before 1860 with Dr. McLean, one of England's early and most productive pea breeders, from a cross of *Beck Gem* with one of the best wrinkled marrowfats. Turner introduced Wonderful and Dr. McLean's Little Gem at the same time. It came to America quite promptly, following Little Gem by three or four years, but was never as popular as that variety. It was held to be the same as *Princess*, *Prince of Wales*, and *Yorkshire Hero*, but the latter two varieties, at least, now differ somewhat from the description of Wonderful.

It was second early, almost midseason, three feet tall, branching, heavily podded from low on the stem; pods large, $2\frac{1}{2}$ to $3\frac{1}{2}$ inches, slightly curved, often poorly filled but at their best with 7 or 9 large peas of excellent quality; seeds white, wrinkled. Hogg says plant similar to *Alliance*, more even and regular, not so succulent, two days later and much superior to it.

Prolific. Ref. 52-57. At least five different "Prolific" peas of the wrinkled or marrowfat type have been grown in the United States, of which the descriptions are so incomplete and the dates so overlapping that it is impossible to separate them definitely or to be certain to which to assign the Prolific Marrowfat grown in Station tests, especially as this shows some green seeds, while descriptions of the varieties known to have come to America are all classed as white-seeded. This difference might easily be due to the change in seed color of peas grown under different conditions. From its similarity to Dr. McLean, of which *Sutton Prolific Marrowfat* is said to be an improvement, our Prolific Marrowfat, from seeds received from British Columbia, is probably Sutton's, with somewhat more green in the seeds.

Height about 2 to $2\frac{1}{2}$ feet; foliage rather large, moderately dark; pods from 15th node, $3\frac{1}{4}$ to $4\frac{1}{8}$ inches long, broad, moderately plump, straight but somewhat irregular, thick-walled, with long rounded ends, moderately deep green in color; peas from 5 to 7, fairly large, almost round and of good color; seeds round oval, much flattened and indented, moderately wrinkled, of very good quality. Crops in midseason, only fair.

Lynn Wrinkled Marrow. Refs. 51-53; *Country Gent.* 20:79. 1862; Hogg *Gard. Yr. Bk.* 14:100. 1873. This pea may be really a Black-eyed Marrowfat, but the wrinkled seeds place it here. It was known in England before 1855 and in America in 1862. It was said to be very productive and to resist drouth well; but Hogg calls it an inferior variety. In this country it seemed very early, but English data make it a midseason variety.

Height $3\frac{1}{2}$ to 4 feet, with small, cylindrical, nearly straight pods, with 6 to 8 small peas so crowded in the pods as to be flat on the ends, like sections of a cylinder. The dry peas were depressed on the ends, wrinkled, white but with a black spot on the hilum.

McLean Prolific. Refs. 54; *Evans Cat.* 1868; *Hogg Gard. Yr. Bk.* 14:99. 1873. McLean Prolific was introduced by Turner in 1860 and was listed in the United States in 1868. It was similar to Knight's White Marrows. Hogg said it resembles Wonderful (McLean) but has much larger pods (cuts show them half longer), broad, slightly curved and blunt-pointed; and is two days later, keeping long in good condition.

Height $2\frac{1}{2}$ to 3 feet, unbranched, with dark green foliage, much blotched with white, with pods generally paired, and containing 5 or 6 well-developed peas; medium early.

James Prolific Wrinkled Marrow. Refs. 55; *Rural N. Y.* 33:108. 1874; *Hogg Gard. Yr. Bk.* 14:99. 1873. Out of 200 varieties tested this was one of 12 to receive a First Class Certificate from the Royal Horticultural Society in 1873, and seems to have been known in the United States in the next year.

It was 3 feet tall, bore fine, large pods containing 6-9 peas which were white and wrinkled when ripe. Hogg's figure shows very heavy, long, broad pods with short necks, blunt ends and parallel sides, and he says they are light green in color, well "sustained from the stem" and nearly all fit for use at one time, in season with Wonderful.

Sutton Prolific Marrow (Ref. 56) was introduced in 1898 by Sutton as an improvement on Dr. McLean, being "extraordinarily productive and with deep green pods, 3 to 4 inches long, borne all over the plant, each containing 8 to 10 peas." This is probably the pea grown here and mentioned under "Prolific" (preceding page).

Leviathan (Ref. 67), a Carter pea, was advertised in England in 1868, and in America in 1869, \$1 a quart being asked for the seed, then a very high price.

It was a main-crop or late, white wrinkled pea, 4 to 6 feet in height, with single, straight pods 4 to $4\frac{1}{2}$ inches long, containing 7 large peas of fine flavor.

Extra Early Leviathan came to the Station from the University of British Columbia in 1922; and seems to be the same pea, slightly shorter-stemmed and smaller-podded under our conditions, and quicker in maturing because sown late. It gave a very poor yield.

Edward VII. Refs. 68, 69; *S. Dak. Sta. Bul.* 91:5. 1915. The Royal Horticultural Society gave an Award of Merit for Edward VII in 1901, but in 1910 erroneously described a test of this pea under King Edward VII, which name applies to a dwarf, green, wrinkled pea sent to the Society gardens in 1901 by Cullen. Edward VII was grown here in 1926 from seed produced at McMillan, Mich., on the test plats of the U. S. Department of Agriculture. The pea tested in South Dakota was probably King Edward VII, as it seems too dwarf and too large-podded for Edward VII, tho received under that name.

As grown here Edward VII was $2\frac{1}{4}$ feet tall, with very slender, unbranched stems, occasionally round at the base instead of angular as with most peas; foliage medium in color and amount, the small, broad leaflets often being in 2s only; pods borne singly on long, slender stalks, from the 7th node or 8th node, 2 to 3 inches in length, quite variable, moderately wide, very plump, straight, filled to tip and edge, blunt- to square-ended with a slight tip, light in color; peas 3-5, large, round oblong, of fair color, but of poor quality; seeds light cream-colored, about 100 to the ounce, very much wrinkled. The crop was not good, tho fairly early.

TALL PLANTS

Incomparable. Refs. 70-75. As might be expected from the name, there have been several Incomparable peas, two of which are of the cream-seeded, wrinkled type, and one of them, at least, grown in America. First of these was Ward Incomparable, introduced in 1847. Tho unknown in the United States under this name, British Queen and Tall White Mammoth, said by some to be identical with it, have both been listed in this country. Other authorities deny the synonymy; but say Incomparable was like Tall Mammoth in growth and like British Queen in seed. This Incomparable is described as Hay Mammoth.

Hurst Incomparable, introduced in 1898, was grown at this Station during two recent seasons.

Height $2\frac{1}{4}$ to $2\frac{1}{2}$ feet (shorter than in England), without branches; foliage moderately abundant, dark green, somewhat whitened, especially on the large stipules; flowers from 8th node; pods on long, slender stalks, often paired, $3\frac{1}{2}$ inches long, broad, moderately plump, straight, not well filled, with pointed ends, the dorsum also often sloping, lighter in color than the foliage (medium green); peas 5 or 6, large to medium, round oval, light green, of very good quality. The crops of pods were good or very good, but the poor filling of the pods lowered the yield of the peas.

A French description of this pea makes the vine taller, foliage lighter in color, flowers single and beginning higher on the stem, and pods longer, plumper, better filled, and slightly curved at the tips; like Duke of York but nearly a week earlier and white seeded.

Yorkshire Gem (Refs. 78; *Rural N. Y.* 47:113. 1888. *Kans. Sta. Rpt.* 2:151. 1890) was, apparently, first advertised in 1881, by Hurst, and first listed in America in 1888. It was tested by several stations, including this one, in 1888 and 1889, and from their notes the following brief description is compiled:

Height 2 to $2\frac{1}{2}$ feet; stem stout, with very short internodes, branching; foliage light, bluish green, or "glaucous deep green," of 2 to 4, rarely 6, rather small, obtuse, faintly toothed leaflets and strongly waved stipules, not whitened; pods often paired, lighter in color than foliage, straight, 2 to 3 or 3 to 4 inches long; peas 4 to 6 or 6 to 8, large, compressed, of good quality; seeds much flattened, "yellow" or "green and white," wrinkled. It was a late mid-season pea, and a good bearer, as indicated by such expressions as "pods very numerous," and "vines well covered with large, well filled pods."

Canning. Ref. U. S. D. A., B. P. I. *Bul.* 21:282. 1903. This pea, origin unknown, was grown here in 1926 from seed secured from the U. S. Department of Agriculture plats at McMillan, Mich. It seems identical with Champion of Scotland and other varieties of that group. Griffith's Canning, listed by Tracy, was probably French Canner (Petit Pois).

Glory of Somerset (Ref. 83) originated with Kelway before 1913. It was grown at this Station from seed sent by the Idaho Station, but is probably not in commerce in America. It might be classed either as dimpled or wrinkled; but we follow the introducer and place it in this group.

Height $2\frac{1}{2}$ feet, foliage very dark colored; pods very large, varying greatly in different seasons, $4\frac{3}{8}$ to $4\frac{7}{8}$ inches, and 3 to $3\frac{3}{4}$ inches, respectively, broad, moderately plump, dark green, very coarsely wrinkled before picking time, straight or slightly curved, not well filled and with pointed or long-rounded ends, often dorsally pointed also; peas vary with the pods, 7 to 8 or 4 to 5, very large, oval or long oblong, dark green. The crops have been only fair.

Royal Early. Ref. 84. Moore, in 1909, calls this pea new, but gives no history of it.

As grown here for two seasons, it has varied considerably in height, from $2\frac{1}{2}$ to $3\frac{1}{2}$ feet, plainly showing indeterminate growth; stems stout, with occasional basal or even medial branches; foliage large, abundant to dense, dark to medium green, only slightly whitened or glaucous; pods from 13th node, usually single but with some pairs, $2\frac{3}{4}$ to $3\frac{1}{4}$ inches long, plump, slightly curved, well filled, with blunt or square ends, of light color; peas about 6, much compressed, of fair color and good quality; seeds larger, less cylindrical, and more irregular than those of the Knight's Marrow group, but somewhat of that type. The variety is late and gives only a fair crop.

Criterion. Refs. 86; *N. Y. Sta. Rpt.* 3:260. 1884. This Criterion, a cream-seeded pea, was grown at this Station in 1884, but probably not elsewhere in the United States.

It was introduced prior to 1874 by Standish of Ascot, Eng., and was quite favorably known in that country as a tall, second early pea.

As grown here: Of medium height only, 3 feet; stems rather large, branched both at the base and above; foliage medium green, lightly washed with white on the leaflets and heavily on the stipules; pods often paired, 2 to 3 inches long, quite wide, plump, rounding to the ends, fairly good green in color; peas 4 to 8, pale green, oval, compressed in well-filled pods; seeds large (80 to oz.), much wrinkled, with a slight admixture of green. It was not very prolific, was ready in midseason and matured the crop rather promptly.

Veitch Criterion, a green-seeded type, said to be superior to Telephone, has escaped all American mention.

Sir Arthur Bignold (Ref. 98) was sent by Holmes to the Royal Horticultural Society in 1913 and given an Award of Merit but failed to secure favorable notice in 1922. Seed of it was received

by this Station in 1922 from the Idaho Station, but is not known to have been grown elsewhere in America.

It is exceedingly like Langport but with foliage decidedly lighter in basal color, tho less whitened and with smaller leaflets and stipules. The pods are of the same shape as those of Langport, decidedly longer, somewhat narrower, and of lighter color, coming very close to Telephone. It is rather earlier than Langport, but not quite so early as Telephone in our tests. The seeds are slightly larger than those of Langport, otherwise indistinguishable from them. The crops were fair to good.

Emperor of Marrows. Refs. 99; Hogg *Gard. Yr. Bk.* 11:96. 1873. Emperor of Marrows was advertised in 1871 by B. S. Wil-

liams as a tall, blue, wrinkled, midseason or main crop marrow; but English references, one or two years later, apparently to the same pea, say it is a tall, late, white marrow much like British Queen.

In our tests the seeds were of the same size and color, but rounder, showing little or none of the cylindrical shape, and more finely, but shallowly wrinkled, indicating very tender skin. The plants differed very little from those of British Queen, but had even denser, darker foliage; flowered and podded much lower on the stems, 14th node, bore pods mostly in pairs, and these were better colored, shorter, plumper, better filled, having 7 to 9 peas of fine color and good quality. The crops promised to be very good but were too late for accurate judgment.

MINOR VARIETIES OF GEM GROUP

Drew Dwarf (Ref. 3) was highly commended in various American horticultural periodicals for a short time after its introduction in 1865; then dropped from notice. Its origin and parentage are not stated, but it is called "a great acquisition," "really a fine sort; not the earliest, but can afford to wait for it;" "one of most valuable introductions," and "as good as Champion of England in quality."

It was about 1 foot tall, branching profusely to form an erect, dense bush, with peas of large size, tinged bluish, slightly wrinkled, with tender skins (unlike Champion of England); medium early, and very productive.

The Shah. Refs. 6, 6a; N. Y. Sta. *Rpt.* 3:253. 1885. The Shah originated with Laxton before 1873, and was introduced in 1876 by Hurst. It was tested at this Station in 1884, but was never much known in the United States.

It was very early, "short-strawed," with slender stem and pale foliage like Extra Earlies, rarely branched; pods above the 6th or 7th nodes, single, short, $1\frac{1}{2}$ to $2\frac{1}{2}$ inches, straight or slightly curved, very plump, and very blunt at the ends when well filled; peas 3 to 7, whitish green, much compressed in well-filled pods; seeds medium sized, cream colored, much wrinkled. Tho early, it matured slowly and was not very productive.

Bliss Everbearing (Ref. 16) originated with Arnold, and was introduced in 1884 by Bliss. It may have come by selection or crossing, from Yorkshire Hero, from which it was once said to be indistinguishable.

The Yorkshire Hero of today has broader pods and larger peas than Everbearing; but the resemblance is otherwise close.

Everbearing is taller than American Wonder, 2 to $2\frac{1}{2}$ feet, occasionally 3, with short internodes, much branched, especially from ground level; foliage intermediate in abundance between that of Wonder and Gem, little whitened, with quite large leaflets, sometimes in 6s, larger stipules, blunt-pointed; pods quite dark in color, considerably longer than those of American Wonder, reaching $3\frac{1}{2}$ inches, occasionally slightly curved at the tip, broad and quite blunt at the end; peas somewhat larger and the seeds decidedly larger than those of American Wonder, but of similar, rather coarsely wrinkled type, from 5 to 7 to the pod, and when dry are more frequently cream than green in color, often with a bluish shade. The variety is ready in late midseason and crops over a long period, giving a good, sometimes very good, yield.

Everbearing may belong with Yorkshire Hero, rather than with Gem-Wonder peas; but uncertainty in regard to parentage and similarity of pods to those of Wonder place it here.

Universal (Ref. 18) is placed with the Gems through lack of data for other grouping. It originated about 1893 with Childs.

Said to be half-dwarf, $1\frac{3}{4}$ feet tall, requiring no support, ready two days after the earliest, and a good producer, averaging 5 peas to the pod.

Very Dwarf Wrinkled (Ref. 19), a "border," or edging, pea of French origin, grown at this Station in 1884.

It appears to have been only 1 foot tall, with foliage of Little Gem type and pods more like those of American Wonder, with large peas and cream colored, much flattened, large, wrinkled seeds; rather early, ripening slowly and quite prolific.

Vermont Wonder. Refs. 20, 21. Hoskins probably developed Vermont Wonder before 1884. It had vines of the same size and much like those of Little Gem, was in season with American Wonder, 4 days after earliest peas, and said to be far ahead of it in productivity and perfection of pods.

Vick Dwarf (Ref. 22) was tested by a Vermont pea grower in 1884, before its introduction, and was grown at this Station in

1890. It was not listed by the introducers in 1892, being superseded by King of the Dwarfs.

A fine, wrinkled variety, 6 to 8 inches high, a week later than American Wonder, and productive, some plants bearing 32, 2- to 3-inch pods, slightly recurved, blunt-ended, with 5 peas of medium color and size.

Cable (Ref. 23) is credited to Alexander from an Advancer x Little Gem cross, made before 1885. It was on sale in 1889 and was tested by the Michigan and Vermont Stations in 1890.

Ready two days after earliest in one test, and was $1\frac{1}{2}$ feet tall, branching, short-jointed, strong-growing, with paired pods, often a dozen to the plant, each with 3 to 5 peas, large but not uniform, sweet, and wrinkled.

Sutton Early Gem (Ref. 24) was grown at this Station in 1886.

When sown on April 14, it gave usable pods in 56 days, with 5 to 7 peas per pod and 7 to 9 pods per vine, all ready within two weeks.

King of the Dwarfs. Refs. 25, 26; N. Y. Sta. *Rpt.* 6:330. 1888. Vick King of the Dwarfs was introduced in 1886 and is probably of Vick's own breeding, an American Wonder x Little Gem cross.

As grown at this Station in 1887, it appears to have been 1 to $1\frac{1}{4}$ feet tall, with a rather stocky, short-pointed, little-branched stem; and deep green foliage of small, smooth leaflets and larger, waved stipules, both distinctly whitened like Little Gem. The pods, usually borne singly on short stalks, were $2\frac{1}{2}$ to 3 inches long, straight or very slightly curved, blunt-ended when fully developed, plump, smooth, paler than the foliage; and contained 5 to 7 roundish or slightly oval peas, much compressed when fully developed, whitish green in color and of unsurpassed flavor.

It was nearly as early as Little Gem, a better bearer and of longer season.

Sutton King of the Dwarfs, introduced in 1903, is similar to Vick, but more like American Wonder, and slightly earlier. This is probably not grown in America.

Chelsea Gem. Ref. 27. Tho a pea of Gem type, Chelsea Gem has been included in the group of Cream-colored, wrinkled peas because of its unmixed cream-colored seeds.

Delicious (Refs. 28; N. Y. Sta. *Rpt.* 6:330. 1888), tested at this Station in 1887, was listed by Gregory in 1888. The variety was brought from England many years before by a lady who said the pea had never been given to the public nor sold in any seed store.

As grown here it was ready for use in 76 days from mid-April planting, grew about 2 feet tall, strong-stemmed, sparingly branched, with large, medium bluish-green foliage little whitened. The pods were often paired, straight or slightly curved, rather blunt, smooth surfaced and contained 5 or 6 rather large, pale green peas of specially good quality. Delicious was very prolific in New York, but not in Kansas.

Early Epicure (Ref. 29), not the Eckford pea, Epicure, appears to have been introduced by Henderson before 1889, when it was tested by at least two experiment stations and listed as already on sale. Its history was lost with Henderson's early records, but it was said to be an early, low-growing pea between American Wonder and Little Gem.

One station record makes it a second early pea, the other very early, ready in 53 days from mid-April planting, or in 49 days when sown in early May. The second station says it was $\frac{2}{3}$ to 1 foot tall, usually with two strong branches, with small, bluish green, often slightly serrate leaflets, single or paired pods $1\frac{1}{2}$ to 2 inches long, slightly curved and with 4 to 6 peas of excellent quality,

changing to cream colored seeds. A catalog reference says it was more prolific than Little Gem or Premium Gem.

Echo. Refs. 30; *Rural N. Y.* 54:314. 1895. Echo originated with Eckford, was introduced in 1890, and came to America in 1895. It received a First Class Certificate from the Royal Horticultural Society, but apparently was never widely grown, even in England. It was a very early, prolific, wrinkled marrow, 2 feet tall, of very superior quality.

Perfect Gem (Refs. 31, 32) was introduced in 1889 by Sutton, and Vaughan Perfect Gem, apparently the same pea, was listed in America in 1908.

It was a second early, $1\frac{1}{2}$ to $2\frac{1}{2}$ feet tall, with dark green stem and foliage, paired, rather light colored, straight pods, very long (4 to $4\frac{1}{2}$ inches in Vaughan's description) and broad, with 7 large, very sweet peas. The pods were "so numerous as almost to hide the plants."

The name places it in this section, but the pods are hardly of Little Gem, or even American Wonder type, tho more like the latter.

Tom Thumb. Wrinkled. Refs. 33, 34. When Tom Thumb peas began to acquire wrinkling is unknown, the first specific mention of this character being in 1889.

This development of Tom Thumb gives a plant with Little Gem foliage, but leaflets often only in 2s, smaller than American Wonder, $\frac{1}{3}$ to $\frac{1}{2}$ foot tall, with short pods, $1\frac{1}{2}$ to 2 inches, in season with American Wonder, straight and round, containing 3-6 peas of medium quality, changing to green, moderately wrinkled seeds.

Tom Thumb Plentiful is a further development of this type, probably a cross, as the original Tom Thumb peas could hardly have developed good quality through selection alone.

Height $\frac{3}{4}$ to $1\frac{3}{4}$ feet, with paired pods, 3 inches long containing 6-8 large, compressed peas, of high quality. As early as American Wonder, more productive and matures its pods very promptly.

Angell Premier. Ref. 35. This Gem-type Premier originated with Angell prior to 1890, when it was tested at this Station. It was apparently a very short-podded but productive pea, "one of the finest table peas tested here." It survived but a short time, as the company dropped it before 1892, tho it was listed by a New York State firm in that year.

Angell Triumph (Ref. 38) originated as an Advancer x American Wonder cross, and was introduced in 1892.

It was said to be "equal to American Wonder in every other respect, several days earlier, and at least one-fourth more productive." It was $\frac{3}{4}$ to $1\frac{1}{4}$ feet tall, and from the figure given, more like Little Gem than American Wonder in pods.

Empire State (Ref. 38a) was listed by Everitt in 1900 as a new first early; but it probably did not originate with him.

It was $1\frac{1}{4}$ to $1\frac{1}{2}$ feet tall, with stocky stems, prolific of dark green pods filled with peas of fine flavor. The wrinkled seeds were green.

Extra Early Manifold (Ref. 38b), listed before 1901 and still carried by McKenzie, is called the "standard dwarf marrowfat" for the West.

It is 1 foot tall, with stout, heavy stem, medium green foliage and pods, the latter being 3 inches long, round, straight, blunt-ended, and containing 6 light green peas of good quality.

Admiral Dewey (Ref. 38c), entirely distinct from Allan's Telephone-like pea so named, was listed in 1902 by Griffith & Turner and was probably just introduced by them.

A "most excellent dwarf," shorter than Stratagem and a week earlier, with stocky vines, and long pods containing 10 delicious tender peas.

Sutton May Queen. Refs. 39; *Gregory Cat.* 1904. This May Queen, an American Wonder x Early Paragon cross, originated in 1884 with Culverwell, was listed in 1893 by Sutton, and reached America 10 years later. Sutton calls it an earlier, dwarf A 1; but as grown here it seems to fall better in the Gem group.

In our tests, from British Columbia seed, it was $1\frac{1}{4}$ feet tall, with a more slender stem than Little Gem, unbranched, with a medium amount of non-characteristic foliage; pods short, of Wonder type and node of bearing, on long, slender stalks, usually not well-filled, containing but few large, round, oval, light green peas; seeds were large, mixed cream and light green, oblong, indented and well wrinkled. It was a first early variety, and gave good crops.

Nott Perfection (Ref. 41) originated with Richard Nott who crossed his Excelsior with Premium Gem to get it. It was introduced about 1895.

Later and taller than Nott Excelsior, $1\frac{1}{4}$ to $1\frac{1}{2}$ feet, stems much branched, foliage of Little Gem type, but less whitened, tendrils quite noticeable; flowers from the 11th or 12th node; pods single and paired; about $2\frac{5}{8}$ to 3 inches long, rather narrow but plump, well-filled, rather blunt-ended, medium green in color; peas 5 or 6, medium to large, light green, of fine quality. It gave very good crops.

Eclipse (Wrinkled) (Ref. 44a) is now hopelessly confused with Surprise, and probably was never more than a selection from that variety made by Cleveland before 1898.

It seems to have been rather shorter-stemmed and longer-podded than Surprise, with a slight curve toward the tip of the pod, and more productive of pods of American Wonder type.

Durban Market Garden. Ref. 46. The Alexander Seed Co. introduced Durban Market Garden in 1901, and carried it for several years. It was of the American Wonder class, earlier, and with larger pods, which, from the illustration given, were somewhat curved.

Herald (Refs. 47; *Denaiffe L. P. P.* 44. 1906) was an English pea, probably known in America only through U. S. Department of Agriculture tests in 1903.

The South Dakota Station reported it as $1\frac{1}{8}$ feet tall, with about 5 flat pods to the vine with 5-6 peas each, which were tender, very sweet and of very good flavor. The French references say the variety was somewhat similar in height and color of foliage to American Wonder, 5 or 6 days later, with quite broad pods, $2\frac{1}{4}$ to $2\frac{3}{4}$ inches long and slightly to considerably curved.

Extra Early Honey Sweet (Refs. 11, 49) was introduced about 1906, "after actual test for several years," by Buckbee, who still carries it, tho it is not mentioned elsewhere.

The plants are taller than those of Little Gem, $2\frac{1}{4}$ feet, and with smaller, rather longer, leaflets. The pods, more often paired and borne on longer, somewhat slenderer stalks, are of Gem type, more uniform and usually more blunt at the ends, and fully as well filled with peas decidedly larger, oval and indented by crowding in the pod. The seeds are Gem-like. The variety is a few days later than Little Gem and decidedly more productive.

Tho quite similar, this is apparently distinct from Honey Sweets, later described, as it is earlier, flowers lower on the stem and is smaller-podded.

Washington Wonder (Ref. 51) was introduced by Lilly about 1907. It was too tall for American Wonder, $1\frac{1}{3}$ feet, but of that type, early, prolific and large-podded, with 6 to 9 good-sized, well-flavored peas to the pod.

Vaughan Forcing (Ref. 52), introduced about 1908, was said to be a "small and wonderful edition of American Wonder," with pods similar in shape and size, borne on plants "3 inches dwarfer" and of upright habit. This can hardly be Sutton Forcing of the Large-podded, Dwarf group, as pods of that variety are said to be as large as those of Gradus.

Honey Sweets (Ref. 53) was introduced by Northrup about 1907 and carried for at least 15 years.

As grown here it was taller, $2\frac{1}{2}$ feet, than the introducer's figures of 1 to $1\frac{1}{4}$ feet, and in other respects more like Little Gem than American Wonder in stem and foliage, tho with the lightly clasping stipules of the latter. It flowered higher on the stem than either, 12th node; pods paired and single, like those of American Wonder, on long, thick stalks, $2\frac{7}{8}$ to $3\frac{1}{8}$ inches long, when paired, decidedly longer when single, quite broad, almost plump, very slightly curved; peas between those of Gem and Wonder in size, rather more to the pod, but less compressed, of poor color and not of the best quality; seeds of American Wonder type.

Honey Sweets was nearly two weeks later than American Wonder, but productive and matured the crop promptly. Differences between this variety and Extra Early Honey Sweet are noted under the latter.

100% Profit. Ref. 55. J. Bolgiano introduced 100% Profit in 1914.

It was apparently a somewhat taller American Wonder, $1\frac{1}{4}$ to $1\frac{3}{4}$ feet tall here (1 foot given by the introducers). It was not quite as early as Wonder, but had larger pods, $2\frac{7}{8}$ to $3\frac{1}{4}$ inches long, more often paired but then much shorter, averaging 6 or more large, dark green peas of excellent quality, with seeds of Gem type

but larger and even more wrinkled. On our soil they became very dark green. The variety was not quite as productive as the best of the group.

Green Pod. We have found no references to this pea, but received seed of it from the Idaho Station in 1922, and grew it for one season only.

Plants about same in size as Little Gem, more erect; stems stout, with short internodes; branches few, basal and medial; foliage less abundant than that of American Wonder, lighter green; pods single, of recent or improved Gem type, borne from 7th node upward; $2\frac{1}{2}$ to 3 inches long or often shorter, slightly curved, with blunt or square ends and long tips; peas 6 or 7, very uniform, large, oval, much indented, of attractive light green color; seeds like those of Little Gem. An early midseason pea of only average productivity.

LARGE PODDED DWARF GROUP

POINTED-POD SECTION

Marvel (Refs. 1; *Rural N. Y.* 39:251. 1880) originated with Laxton before 1873, probably as a Prolific Long-pod x Veitch Perfection cross; received "First Class" from the Royal Horticultural Society; and was advertised for sale by Veitch (1) in 1878. It was noticed in America in 1880, tested at this Station in 1883 and 1884, and on sale in this country in 1889.

Height, 2 to 3 feet, branched at base and above; foliage ample, often wavy, rather deep bluish green, with large, slightly glaucous, slightly whitened stipules; flowers imperfectly opening from 10th node; pods paired, on short, strong stalks, 3 to $3\frac{1}{2}$, rarely, 4 inches long, nearly straight but appearing curved because of the strongly arched ventrum and slight curve at tip, broad, quite plump, with long-rounded ends, and rather noticeable tips; peas 8 or 9, large, whitish green in color and somewhat compressed when full grown; seeds light cream in color and somewhat oblong, slightly wedge-shaped, flattened and well wrinkled. Yields very good, ready in late midseason, maturing quite promptly.

Green Prolific (Ref. 2) was sent to this Station for testing in 1885 by Bennett but was not reported in the year's pea trials.

Habit stocky, only $\frac{1}{2}$ foot tall; foliage fine, deep green, slightly whitened; pods paired, medium green, 3 to $3\frac{1}{2}$ inches long, broad, decidedly curved, with long-rounded ends; peas 6 to 8, rather small, pale green, slightly oblong, somewhat compressed.

Daniels Matchless Marrow, and **Sutton Matchless Marrowfat**, or **Matchless**. Refs. 3-5. Much confusion exists between the many "Matchless" peas, of which some have already been described; but those named above were considered as one by the Royal Horticultural Society in 1905. Sutton dropped Marrowfat from the name in 1912. So far as known Matchless Marrow or Marrowfat has been grown in America only in tests at the University of British Columbia, at this Station and by the United States Department of Agriculture. The variety originated about 1887 as a Ne Plus Ultra x Veitch Perfection cross. It is a second midseason or main-crop variety. Rather tall for this group but would be shorter in most American conditions.

Height 6 feet to 3 feet, in different tests; foliage scanty, pale green, much whitened, $4\frac{1}{2}$ to 5 inches long; pods mostly paired from about 14th node, broad, often inflated, straight, pointed at the ends, dark green with some bloom; peas 7 to 8, large, dark green; seeds of medium size, more or less compressed, well wrinkled and faintly bluish or greenish cream in color. The crops were good.

Sutton Perfection (Refs. 11; *Rice Cat.* 1918) originated with Culverwell sometime previous to 1890 when introduced. It did not reach America until 1918.

In our tests it was a little taller than Dwarf Telephone but with stouter stems holding it more erect, less often branched, with larger leaflets and round-tipped stipules, clasping the stems more deeply; with less prominent tendrils; flowers from 14th node; pods usually longer, $3\frac{3}{4}$ to $4\frac{1}{4}$ inches; sometimes shorter, broader, less plump, more wrinkled at harvesting, rather better colored, very slightly curved, not as well filled, less rounded at the ends, and without noticeable tips; seeds quite uniformly yellowish light green in color, rather than mixed cream and green, larger and more wrinkled than those of Dwarf Telephone. The two varieties matured at the same time, late midseason, and crops of both were only fair.

Rentpayer. Refs. 12; Galloway Bros. *Cat.* 1913. This Rentpayer, entirely distinct from Rent Payer, was introduced by H. Brownhill, Sale, Eng., about 1895; and was said to be a Duke of Albany x Little Gem cross, with pods and peas like the former and plants of the same size as those of Little Gem. As grown here, from

Melbourne Market. Seed of this pea came to us from the U. S. Department of Agriculture plats at McMillan, Mich., and it was grown here in 1926. It is very similar to some older peas of the Gem group, but apparently differs from each in one or more characteristics.

Height about $1\frac{1}{2}$ feet, erect or slightly drooping; stem moderately stout, short-jointed, unbranched, foliage medium to abundant, dark to medium green in color, with bluish tint, whitened especially on the stipules, and with noticeable white veins, the 4 or 6 leaflets small and long, and the slightly larger stipules are sharp-tipped; flowers above 9th node, bringing the pods at the top of stems, on short, stocky stalks, very even, $2\frac{1}{2}$ to $2\frac{7}{8}$ inches long, narrow, plump, straight, rounded to blunt at the end, and well filled; peas 4 to 7, moderately large, round, light green, of good to very good quality. It was a second early pea, and very productive.

English seed, the variety corresponded very closely to this description, especially when pods grown at McMillan, Mich., were substituted for those produced under rather poor conditions at the Station.

Height, $1\frac{1}{2}$ feet; pods (McMillan) $4\frac{1}{4}$ to $4\frac{1}{2}$ inches long, broad, oval in cross section, considerably curved, pointed to long, rounded at the ends, with short but distinct tip, deep green in color, well filled; peas 7 to 9, very large, indented, oval to oblong, medium green in color and of very good quality; seeds very large, mingled cream and green, but only moderately wrinkled. Crops, fair to good and ready in late midseason.

Productive Marrowfat (Refs. 13; S. Dak. Sta. *Bul.* 85:5. 1904) was listed by Sutton in 1896, and was brought to America for testing in 1903. It was grown in our tests from British Columbia seed; but full data were not secured, owing to poor stand. The description is partly compiled.

True dwarf, seldom over 2 feet; foliage dark green; pods medium green, $3\frac{3}{4}$ to $4\frac{5}{8}$ inches long, straight, broad, long-rounded at the end and without distinct tips, smooth, and not well filled; peas, 4 to 7, large, smooth, round, irregularly oblong, almost dark green in color, of very good quality; seeds well wrinkled, light green, medium to large in size; crop matured in late midseason; elsewhere good or better than good.

Sutton Forcing (Refs. 14; S. Dak. Sta. *Bul.* 91:5. 1904) came from a Culverwell cross between Royal Jubilee and American Wonder, introduced in 1896.

As early as American Wonder, even more dwarf; with pods almost as large as those of Gradus, and similar in shape. Only 3 to 6 pods were produced on a plant, and the pods contained only 5 or 6 good peas.

Electric (Refs. 49, 50), not Electric Extra Early, was listed by the Harnden Seed Co., Kansas City, Mo., in 1913, and probably originated with them. It is still listed in the mid-west, but apparently never extensively grown.

As tried here, dwarf (1 to $1\frac{1}{4}$ feet), with unbranched, stout to medium, erect stem; foliage abundant, dark green but whitened and glaucous, appearing lighter, similar to that of Peter Pan; flowers begin at the 7th node; pods single, on short, thick stalks, similar in shape to those of Peter Pan, being slightly curved, poorer in color, average half an inch less in length, rather less pointed, better filled; peas also light in color; seeds much like those of Laxtonian and Blue Bantam but rather more uniformly light green, over cream, making a rather distinctive coloration. Electric is very early for the group, tho hardly a first early; and gives good to very good crops.

Little Midget (Refs. 51, 52) originated in 1913, with Condon as a Gradus x Sutton Excelsior cross; apparently listed only by this firm.

In plant exceedingly like Blue Bantam, but with less bloom and with broader leaflets; flowers rather lower on the stem, 6th node, and flower and pod stalks slightly less stocky; pods fully half an inch shorter, light in color, and less well filled because of abortive ovules; peas rather light colored; seeds very like those of Electric, with even more light green or bluish green shading of the few cream colored ones. Because of poor filling of the pods and general conditions the crops of Little Midget were only poor to fair, tho as early as Electric.

Early but Good (Ref. 55) was introduced in 1916 but not originated by Elliott (2).

Very similar to Peter Pan, about the same in height, having dark luxuriant foliage, broad, curved, pointed pods $3\frac{1}{2}$ to 4 inches long, medium green in color, and ready in early midseason. Quality rather than productivity was stressed.

President Wilson (Ref. 56) was introduced by Sutton in 1919; and probably grown in the United States only in tests. Seed of it was sent to this Station by the University of British Columbia.

Plant of Blue Bantam type, but more branched, with broader leaflets similarly square at the tip; flowers higher on the stem, 11th node; pods on similar short, thick stalks, correspond very closely in size, shape, and content of peas to those of Blue Bantam; pods and peas of rather better color, but season later and crop not as good under our conditions; tho the variety is said to be exceptionally productive in England, where it is called a "new Dwarf Defiance." Pods are longer than those of that variety and often inflated.

Dwarf Perfection (Ref. 57) was introduced in 1922 by Tait.

Very close to Blue Bantam, but slightly more dwarf, with stouter and more erect stem, more branched especially from the upper stem; foliage similar, including square or cut-in tip of leaflets; pods like those of Blue Bantam, possibly a trifle shorter, distinctly broader, rather better filled; seed differences very slight. Dwarf Perfection seems a day or two later and holds rather longer; crops about the same; so that the two varieties seem horticulturally identical if not actually so.

Regal (Ref. 59) originated with Bruce before 1919. Not found in the United States; but grown here from British Columbia seed.

Very similar to Progress, even more dwarf; but flowering a node higher, 9th, and the flowers are small and few in number at any one time. Flower and pod stalks frequently bear small leaves at the joint between peduncle and pedicel; pods straight, rather less plump and not curved like those of Progress, dark green in color; ready about as early; crop good to very good.

Superb Marrow. Cataloged and probably raised by Brand. It was grown here from British Columbia seed; and belied its name. Tho dwarf and early, the pods were small, rarely reaching 3 inches, often containing only 2 or 3 peas; and yield very poor. Superb Marrow was noteworthy as an instance of the complete change from cream-colored seeds sown, to green seeds harvested, the colors in each case being almost unmixed. Brand says it was 3 feet tall with pods containing 9 or 10 large peas of good flavor.

Bedford Champion (Ref. 60) originated with Laxton Bros. and was distributed in 1923 by originators and by Hurst. As S. T. Wright, it received an Award of Merit. It is as yet commercially unknown in the United States; but was grown here from the originator's seed.

Height half that given for England, $1\frac{1}{2}$ to $1\frac{3}{4}$ feet; and the pods were very short, so it is not thought well to give our description. It is said to be similar to Gradus, but much more robust, as early, or earlier, with long, very dark green pods, straight or slightly curved, with long-rounded to pointed ends, and containing 8-10 large peas. The seeds are very large, irregular in shape, mostly light green, but with some cream. It ranks as a second early pea, and under better conditions gives very good crops.

Giant Stride (Ref. 61) originated with Carter from a cross made in 1916 "with the object of securing on Mendelian lines a dwarf pea bearing pods as large as Quite Content." Seed of the pea was distributed in 1925; but the variety is not known to have reached America commercially tho included in U. S. Department of Agriculture tests, and grown here in 1926.

Height about $1\frac{3}{4}$ feet; stem very stout, but droops from weight of pods, unbranched; foliage abundant, medium green, with white veins and added whitening, especially on stipules, but little bloom, with large broad leaflets in 4s or occasionally 6s, and somewhat larger, round-tipped stipules; neither tendrils nor flowers characteristic; pods single, from 10th or 11th node, on short, very thick stalks, often leafy, the longest found on any dwarf pea, quite uniformly $4\frac{3}{8}$ to $4\frac{3}{4}$ inches, occasionally 4 inches, only moderately wide, plump, smooth surfaced, slightly curved toward tip, often poorly filled, showing a tendency to "puffiness," rounded to blunt at the ends, rich light green in color with much bloom; peas 7 or 8, not large for the size of pods, ratio of peas to pods being $1\frac{1}{2}$ to 1, round, smooth, dull dark green, losing color in cooking, not of superior quality; seeds above medium in size, nearly round, only slightly indented, well but coarsely wrinkled and light bluish green in color. It is late midseason pea, and gave a very good yield of pods, fair of peas.

Warlock Prize (Ref. 62) is a pea "from the South of England" introduced in America by Breck and tested here.

Extremely dwarf, $\frac{3}{4}$ to 1 foot; stem moderately stout, holding the plant erect, with occasional basal branches; foliage abundant, dark green, much whitened, with stipules much larger than leaflets, sharp-tipped, serrate well toward the tip; flowers begin at the 6th

node or 7th node, distinctly creamy in bud but open lighter, with green at the base; occasionally paired; pods rarely paired, on short, thick stalks, similar to those of Peter Pan, but with curve mainly toward the tip; better filled; peas 5 to 9, averaging 7, very large, round to indented, oblong and flattened, sometimes wedge-shaped, almost dark green in color, of very good quality, sweet but not especially tender; seeds resemble those of Peter Pan, but are rather better colored. Warlock Prize is a second early or early midseason variety and gave a good yield.

California Gem. Originated in that State several years ago, was named by W. R. Palmer, Cowichan, B. C., who received it from J. A. Beedham, Victoria, and he from a California gardener.

Very similar to Green Gem, half a foot taller, without medial branches, with conspicuous tendrils and flowering at 11th, instead of 9th node; pods one-quarter inch longer than those of Green Gem, heavier walled and holding freshness better, with more and smaller peas. In season these two Gems differ materially, California Gem being very late, and only moderately productive.

Arcadian. We grew this pea in 1926, from seed produced on the United States Department of Agriculture plats at McMillan, Mich.

Plants were of Dwarf Telephone size and type, slow-growing; foliage rather darker, tho more whitened or with a yellowish tint, with very large leaflets, occasionally 5 in number, and round-tipped stipules; flowers very large, creamy or greenish white, beginning at the 11th or 12th node, in pairs, stalks rapidly lengthened so those of the pods were long and heavy; pods 4 to $4\frac{3}{8}$ inches long, broad, moderately plump, straight and decidedly long-pointed, but with distinct tips, medium to light green in color, wrinkled before ready to harvest, holding freshness only moderately well; peas 5 to 6, very large, compressed almost to squareness, oblong, dark green in color, and of good quality. It was a midseason variety and gave a good to very good yield.

El Paso Wonder (Ref. 62a) was listed among peas grown in 1925 on the U. S. Department of Agriculture plats at McMillan, Mich. It originated in the El Paso Valley "several years ago" from a cross between Stratagem and Gradus, and is very popular there as it stays green during hot weather. It is said to have exceptionally large pods, equal in size to those of Dwarf Telephone, the pods growing mainly on one side of the plant and picking easily. It grows about one foot high and is very vigorous.

BLUNT PODDED SECTION

Dwarf Prolific. Refs. 64; N. Y. Sta. Rpt. 3:270. 1885; Hogg Gard. Yr. Bk. 14:77. 1873. Dwarf Prolific is one of the earlier peas originated by Dr. McLean before 1865 from crossing Beck Gem with one of the "best wrinkled peas" of his time. It was tried at this Station in 1884. It plainly showed Beck Gem influence.

Height $1\frac{1}{2}$ to 2 feet, with stout, branched stems, dark green foliage, more or less whitened and glaucous; pods 2 to $2\frac{1}{2}$ inches long, usually paired, slightly curved, very plump, blunt-ended, medium green in color, containing 4 to 7 pale green, slightly oblong, much compressed peas, or pale green or cream, well-wrinkled seeds. It was rather late, matured promptly and was moderately prolific.

Hogg gives this name as a synonym of Royal Dwarf, a smooth seeded pea.

Imperial Champion (Ref. 78) originated before 1885 with Horsford. It was also sent to England, but apparently won favor in neither country. It was much more dwarf than Horsford Market Garden, with broader, more curved pods and larger peas; earlier, and apparently quite prolific, averaging 14 pods to the vine and 4 to 5 peas to the pod.

Sensation (Refs. 81; S. Dak. Sta. Bul. 91:7. 1905) originated with Laxton, before 1885, but was distributed in 1886 by Harrison (2). It was tested at the South Dakota Station in 1904, and grown here lately; otherwise unknown to America.

It is of Sutton Excelsior type but shorter, $1-1\frac{1}{4}$ feet tall, more erect, unbranched, with rather smaller leaflets, blunt at the tip, and with fewer, heavier, and lower teeth on the stipules; pods not quite as large, but rather more plump, straight, more blunt at the ends, and almost tipless, better filled; peas fewer, larger, of better color and better quality; seeds large, almost cubical except for indenting and wrinkling and among the darkest green of all peas. Sensation is very late, requiring about 10 weeks for table use; but gave good to very good crops.

Blue Wrinkled (Ref. 82) originated with the Specialty and Novelty Seed Co., Newton-le-Willows, Eng., and was tested at this Station in 1888. It was of Horsford Market Garden type but larger

in plant and pod, with more bloom on foliage and deeper green color on pods.

Dwarf Main Crop (Ref. 83) was from the same source as the preceding variety, and also tested here in 1888. It was of Sutton Excelsior type, and seems to have resembled it in most characters, but later and with much less wrinkled, green and white seeds.

Renown (Refs. 84; *Rural N. Y.* 54:314. 1895) originated with Eckford, before 1890; and was brought here in 1895, but did not gain a permanent place.

Apparently of Horsford Market Garden type; and said to be a fine main crop variety, robust, $2\frac{1}{2}$ feet tall, with abundant, deep green, square-ended pods and peas of first rate quality.

Sutton Favorite. Refs. 85; S. Dak. Sta. *Bul.* 85:5. 1904. This, one of many Favorites, was introduced by Sutton in 1895, and was tested, for cooking quality especially, at the South Dakota Station in 1904 and 1905, the two tests not agreeing. The variety has probably never been in commerce in the United States.

It is quite different in type from most of the varieties in the group; dwarf, $1\frac{1}{2}$ to 2 feet tall; stems fairly strong, internodes short, branched above ground level; foliage dark green; pods single, light green in color, coarsely wrinkled or covered with shallow, irregular protuberances, about $3\frac{1}{2}$ to 4 inches long, very broad, flattened-oval in section to almost flat at edge, short rounded to nearly blunt at the end, with noticeably flat tip; peas about 6, large, pale green, sweet. It is a second early, said to bear an abundant crop of its broad, heavy pods.

Pierremont Gem (Refs. 88, 89) was distributed by Kent & Brydon, in 1898, and grown in tests in this country in 1903 and 1904. It is said to have originated from a double cross (Earliest of All x Sharpe Queen, x American Wonder).

Its dwarfness, 1 to $1\frac{1}{4}$ feet, places it in this group rather than with Ne Plus Ultra, which it is said to resemble in pods. These were borne singly, were noticeably square-ended, $2\frac{3}{4}$ to $3\frac{1}{4}$ inches long, broad and straight, dark green, contained 6 or 7 large, wrinkled, bright green peas, and were borne singly or occasionally in pairs from 9th or 10th node. It was a second early, about a week later than American Wonder; and gave fair yields.

Ideal (Refs. 90; Steckler *Cat.* 1918) originated with Sutton, in 1901; but apparently was not listed here until 1918, and even now is but little known.

It is taller than Sutton Excelsior, $2\frac{1}{4}$ to $2\frac{1}{2}$ feet, with rather slender stems, making support advisable, with medium length internodes, and only occasional basal branches; foliage less abundant, finer, with stipules glaucous and much whitened by large spots and blotches, bloom scanty; flowers white, borne singly from the 8th node; pods dark in color, from a quarter to a half inch shorter than those of Sutton Excelsior, but much plumper, occasionally thicker than wide, and saddle-backed, well filled to the short-rounded or blunt end which bears a distinct tip; peas few in number, rarely over 5, but very large, round or slightly indented, oblong, dark green in color, sometimes with a yellowish tint; seeds much smaller than the size of the green peas indicates, ranging from 104 to 121 to the ounce, roughly spherical, somewhat indented, only moderately wrinkled, and may be, from different sources, largely cream with some grayish green, about equally cream and medium green, or practically all good medium to dark green. Ideal is fully as early as Excelsior, and gave good crops.

Victor and Victor Marrowfat. Refs. 92-94; Barnard *Cat.* 1921. Three peas, of the same or confusingly similar names, fall in this section, none of which has been grown in our tests, or sufficiently described in American catalogs to make identity certain.

In chronological order these are:

Eckford Victor, originated by Eckford about 1883, as a Champion of England x Advancer cross. It was dwarf, $2\frac{1}{2}$ feet tall, robust, with paired, fine, well-filled, square-ended pods containing 6 or 7 large peas. It was second early in season.

Victor Marrowfat, introduced by Carter, was only $1\frac{1}{2}$ feet tall, of bushy habit, with dark green foliage and paired, dark green pods containing 7 large, "delicious" peas. It also was apparently a second early, and a "good cropper."

Victor, introduced by Veitch (1), is described in the Pointed-podded section of this group.

Of the American grown pea of this group, we know only that it was a productive, midseason variety, 2 feet tall, with large, dark green pods, and peas of excellent quality.

Sutton Incomparable (Refs. 95; Rice *Cat.* 1918) was introduced in 1908. Because of failure to recognize it as distinct from Hurst Incomparable, the Sutton pea was not grown in our tests.

It is recorded by American seedsmen as one of the best main crop varieties, about 3 feet tall, very sturdy, with large stem, and producing a heavy crop of 5-inch pods, very broad, square at the end and dark green in color. English descriptions add branching at base, flowering at 14th node, pods single and paired, inflated. In America it matures with Telephone or earlier, in England is called second midseason.

Perfection (Ref. 96), one of the largest peas so named, is of unknown origin; but is apparently distinct from all others. It was grown here from seed from the Pacific Coast, where it seems to be best known. It may be Veitch Perfection.

It is very similar to Yorkshire Hero but more drooping in habit, with only scattered medial branches, larger and more regular shaped leaflets in 4s as well as 6s, much larger, round-tipped stipules more deeply clasping, both leaflets and stipules being distinctly glaucous as well as whitened; pods borne singly from the 13th or 14th node on short, thick stalks, often half an inch longer than those of Yorkshire Hero, and average somewhat larger, tho less uniform, even broader, but not quite so plump, straight, better filled to the tip but not to the edge, blunt to square at the end and without distinct tips; peas not so large nor so much compressed, oblong, and medium green in color; seeds average one more to the pod and are decidedly smaller than those of Yorkshire Hero, deeply indented, not as well wrinkled and with a larger percentage cream colored, with little or no bluish shading. Perfection is earlier than Yorkshire Hero but not as good a producer.

Top O' Th' Morn (Ref. 97) originated with Keeney and was introduced by Vaughan in 1919. It was also sent to England about 1915; but apparently attracted little attention. It was grown here from both originator's and introducer's seeds. It is of Sutton Excelsior type, but differs from it in several points.

Rather more dwarf, 1 to $1\frac{1}{2}$ feet, more erect; foliage rather less abundant and decidedly lighter colored, with leaflets not as broad, and stipules blunt-tipped rather than rounded, with shallow teeth and more glaucous; tendrils small and inconspicuous; pods not as broad, plumper, wrinkling earlier, better filled, rather more blunt at the end and without noticeable tips, medium green, not holding freshness well; peas 5, medium to large, medium green, indented, oval to oblong; seeds a trifle larger but otherwise very similar to those of Excelsior, becoming much more wrinkled and greener in color under some growth conditions.

Early Dwarf, or Prince Arthur. Refs. 98-100; Roy. Hort. Soc. *Jour.* 41:287. 1915. Catalogs of the firm and the reference given above indicate that Sutton first introduced this pea as Early Dwarf in 1910 and changed the name in 1915 to Prince Arthur, under which name it was "Highly Commended" by the Royal Horticultural Society in 1920.

It was grown here in recent tests, under the second name, from seed from British Columbia, and from the introducer, but is not known to be on sale in the United States unless it be as Rice Early Dwarf, which is very similar to, if not identical with, Prince Arthur. Rice describes his early dwarf as a dark-podded Sutton Excelsior. Our descriptions gave the pod color as medium green (Rice "very dark green"), which was the only marked difference between it and Prince Arthur, a dark-podded pea. Rice Early Dwarf and both strains of Prince Arthur were 4 or 5 days earlier than Excelsior. To say that Prince Arthur and Rice Early Dwarf are early, dark-podded and slightly more dwarf, Sutton Excelsior well describes each variety. Neither was quite as productive as the older variety.

Record Breaker Six Weeks (Ref. 102) originated with, and was introduced by, Salzer previous to 1923. Different stocks of it were grown here, so differing in characteristics that we must depend on a letter from the introducers for partial description. Vines dark green; leaves medium size; pods $2\frac{1}{2}$ to 3 inches long, round, blunt, containing 6 or 7 peas.

Bestever (Ref. 103) originated with A. R. Ward, and was introduced by the Grand Junction Seed Co. in 1924.

As grown here: Height $2\frac{1}{2}$ to 3 feet; stem rather slender, unbranched; foliage scanty to medium, light green, with leaflets in 4s, above medium in size and breadth, and much larger, round-tipped stipules, only slightly serrate, both whitened and somewhat glaucous; flowers from 6th to 7th node, very low for such tall plants, single and in pairs on long, slender stalks; pods 3 to $3\frac{1}{2}$ inches long, moderately broad, very plump, straight, well filled to the rounded tipless ends, and very light in color; peas about 7, of medium size, not much indented, oval to oblong and yellowish green in color;

seeds large, round oval, sometimes almost cylindrical, almost equally cream and green, well wrinkled. It is very early and bears good crops.

DAISY SECTION

Mayflower. Refs. 106; Breck Cat. 1913; letter from Jas. Carter & Co., April 19, 1927. Mayflower originated with Carter in 1899, from a cross between Daisy and Wm. Hurst. It is not much known in the United States and is now not listed here, the seeds for our tests coming from British Columbia.

As grown here it is very dwarf, not reaching a foot in height, unbranched, darker in foliage but lighter in pods than Buttercup, and with more pointed pods; peas similar in shape, but also lighter in color, and seeds all light bluish green and well wrinkled. It was a first early or early variety and gave very good crops. In recent English tests it seems to have lost its earliness.

Model Mayflower, originated by the same firm in 1910, a selection from Langley Gem, has not reached the United States.

Daffodil (Refs. 107; Johnson Seed Co. Cat. 1909) is also a Carter pea, introduced a year later than Buttercup and Mayflower and said to be a distinct improvement on British Wonder.

It was noticeably "bunchy" in early growth, 1¼ feet tall, with moderately stout stem, erect but drooping with age and weight of pods; unbranched; foliage rather scanty; leaflets in 2s and 4s, slightly glaucous, dark green, large, very broad, having blunt or notched tips; stipules varying from slightly smaller on lower nodes to much larger above, dark green but whitened and very glaucous; blossoms began at 10th node, single; pods 3 inches long on short, heavy, often leafy, stalks, straight, rather slender, long rounded at the ends, sometimes dorsally pointed, without tips, dark green, and well filled; peas 5 to 9, very large, indented, ovate or oblong, sometimes wedge-shaped, dark green. The pods were heavy walled and held their freshness and color well. It was almost first early in season and gave good crops.

Swastika, Te Aroha, and Good Luck. Refs. 108-111. It is practically impossible to say how many varieties of wrinkled peas are included in the names given above; and Good Luck is also used for a smooth-seeded variety. The Swastika symbol betokens good luck, and Te Aroha is the Maori word for "Good Luck," this name being applied to a pea originating with F. Cooper, Wellington, New Zealand. Swastika, listed in 1909 by Vick, differs very little, in the characters that are given, from Te Aroha as tried here from seed grown in the U. S. Department of Agriculture plats in northern Michigan, but is quite unlike Swastika as grown at this Station from British Columbia seed. The latter seems to correspond to the Te Aroha listed by Burnett Bros., while Good Luck, listed by the Routledge Seed Co., but probably from Hawaii originally, is apparently the same as Vick's Swastika and Te Aroha from the U. S. Department of Agriculture collection as we grew it. The differences, as nearly as we can determine, are of plants, rather than of pods and seeds; and these might easily vary in the many changes in locality made. Bunchiness of the growth from upper internodes was noted for all the varieties or strains that we grew.

The pods are recorded as 2¾ to 3½ inches and 2½ minimum with 3 to 3¾ usual, for the two lots, both being noted as "uneven," other variations in description sheets are "broad" or "moderately broad," "plump" or "moderately plump," "straight" or "very slightly curved," and number of peas 3 to 7 or 4 to 8, and size of peas "very large" or "large." The pods were "rounded" or "rounded to pointed," and medium green in color, none of these differences being clearly enough cut, or so characteristically grouped, that separation of the two types is possible. They were the same in season, second early, and neither gave better than a fair or fair to good crop.

Perfect (Ref. 17) was offered in 1899 by Burpee; was carried only a short time by that firm, and apparently nowhere else listed.

Height 2½ to 3 feet; growth vigorous; foliage large. It was late, probably above average in yield, and bore 4½ to 5½-inch pods, 1 inch broad, with "greatly sloping points," containing 5 to 7 large, dark green peas of finest quality.

Edwin Becket. Refs. 18; Johnson Seed Co. Cat. 1913. This pea was named for its originator, Edwin Becket, gardener on a large English estate; and introduced by Cutbush about 1900 when it received a First Class Certificate from the Royal Horticultural Society. It is supposed to be a Gradus x Duke of Albany cross, and in England would undoubtedly be placed in the Telephone group. As grown in the United States, however, it is semidwarf.

Height 2¾ feet, about half a foot more than Dwarf Telephone; stems more slender, unbranched; foliage light green; leaflets rather larger; stipules rounded, less serrate and much whitened; flowers large, distinctly green at the base; pods shorter, borne singly from the 8th node up on long, slender stalks, more like those of Early Morn, being poorly filled and long rounded at the tips; peas similar in shape and size to Dwarf Telephone; of very good quality, but not as sweet as some other varieties, possibly through premature disappearance of the sugar, which the very noticeable wrinkling might indicate; seeds nearly all light to medium green in color, and among the best and finest wrinkled of all varieties grown. It was a midseason variety of poor productivity.

Market Master (Ref. 19) was introduced in 1900 by Johnson & Stokes, and said to be a new pea from England.

It was grown here recently from British Columbia seed; and seemed much like Dwarf Telephone reduced in height, 1¾ to 2 feet, but flowering and podding much higher up the stem, 14th to 15th node, and not so frequently branched; foliage similar, but more whitened, rather coarser, and with round-tipped stipules; pods slightly broader and flatter, poorly filled and more pointed, without distinct tips, rather light in color; peas larger, more indented and more oblong, poor in color, but of good quality; seeds very light bluish green, smaller and more wrinkled. Season was the same, and crop rather better than that of Dwarf Telephone.

Dwarf Jumbo. Ref. 20. Only scanty details are given of Dwarf Jumbo, introduced by Salzer in 1901, but figures for height, 1½ to 2½ feet, and pod length, 6 inches, place the variety in this group; the illustration shows pointed pods. It was classed as early.

Green Gem. Refs. 21, 22; Darling Cat. 1913. Green Gem originated with Sutton, was introduced in 1901, and received an Award of Merit from the Royal Horticultural Society in 1905. It was many years in reaching America and has never been widely grown, tho having an attractive pod, and peas of high quality. Seed of it came from the Idaho Station and from British Columbia.

It was very similar to Market Master, but not quite as tall, with larger foliage, deeper green, but more whitened, and bearing, from the 9th node, single pods on short, thick stalks, hardly as long, but more uniform, giving about the same average length, rather more pointed, with a distinct dorsal slant to the point, without any distinct tip, not quite as well filled, but of much better color, as were the peas. It was a week or ten days earlier than Market Master or Dwarf Telephone, but not very productive.

King Edward VII. Refs. 23, 24; Portland Seed Co. Cat. 1909. Much confusion exists between King Edward, King Edward VII, and Edward VII, distinct varieties, but the one here referred to was sent for trial to the Royal Horticultural Society in 1901 by Cullen, and was later listed by Carter as King Edward VII Dwarf. It probably first reached America in 1908, was listed by several western firms, but was not found for our recent tests.

It was evidently very similar to Green Gem, the dark color of foliage and pods being emphasized; and both English and American references give its height as 1½ feet. It was said to bear paired, pointed pods, and to yield heavily. In tests at Wisley in 1925 (*Roy. Hort. Soc. Jour.* 52:107, 1927) it is called second early, and said to resemble Sherwood, but with pointed pods.

Matchless Wonder (Ref. 25) was introduced in 1901 by Northrup, as a wrinkled pea as early as Alaska, 1⅔ to 2½ feet tall, with large pods, broad and occasionally slightly curved, very long pointed and with long necks.

Dwarf Giant-podded. Refs. 26-28. J. Bolgiano listed Dwarf Giant-podded Prolific Green Marrow as early as 1901 and later sent us packets labeled "Prolific" and "Green Marrow" which proved identical with the pea under the longer name. Apparently the same pea was listed by Burpee in 1904 under the short name, but no clue is given to the history unless Alexander Prolific, originated about 1885, is the original variety. This, the data given for Alexander's pea are not extensive enough to confirm; but do not contradict.

As grown here, as Dwarf Giant-podded, or as Prolific (from Bolgiano), very similar to Dwarf Telephone, but with darker, coarser foliage, round-tipped stipules clasping the stem very deeply; producing small flowers higher on the stems, 15th to 17th node; pods very similar, not as well filled, better colored; peas larger and better colored. The season is the same and Dwarf Giant-podded the better producer.

Victor Marrowfat (Ref. 29) was introduced by Carter about 1904, and probably never reached America. It is mentioned here

through similarity of name to Veitch Victor, which follows; but it is described with Victor in the second section of this group.

Veitch Victor. Refs. 30; Barnard Cat. 1921. Victor originated with Veitch (1) and received an Award of Merit from the Royal Horticultural Society in 1910. It was apparently first listed in America in 1921.

As grown in our recent tests, nearly a foot shorter than Dwarf Telephone, stout-stemmed and erect, with branches almost entirely medial, darker and larger foliage, decidedly whitened, having round-tipped stipules with heavier teeth near base; pods dark green, $3\frac{1}{2}$ to $4\frac{1}{4}$ inches, broader, hardly as plump, rather more pointed at the ends and not quite so well filled, tho normally with two or three more, lighter colored peas. These were large, oblong, and flattened almost to disk-shape in well-filled pods. The seeds were much larger than those of Dwarf Telephone, oblong, very much indented and flattened, fully and deeply wrinkled, but rather coarsely, and from light green to deep green in color. Good to very good crops of pods were ready in early midseason, and the peas were of high quality.

Record. Refs. 31; Breck Cat. 1914; letter from Breck, Mar. 14, 1927. Record came to America from W. W. Johnson in 1913. As grown at the Station, the Record, in plant at least, seemed like World Record, and a recent letter from the American introducer says Johnson's name for it was World Record. Johnson's stock probably came from Sutton.

Commander (Ref. 33) was listed as new by Eckford in 1908, but apparently has never reached America except for tests.

It is very similar to World Record but with glaucous, heavier foliage, the leaflets as well as the round-tipped stipules showing serrations, on the former as notches near the tip; flowers much higher on the stem, 13th node, and occasionally, like the pods, in pairs; pods very much larger than those of World Record, 4 to $4\frac{3}{8}$ inches for the general run, but often $3\frac{1}{2}$ inches only; broad, not plump, straight but sometimes distorted thru poor filling, with long-rounded ends; peas 7 to 8 in well-filled pods, of medium size, not compressed, oval, medium green in color and of only fair quality; seeds much like those of World Record, but lighter, more bluish green in color.

Commander is a second early or early midseason variety of better than good productivity, hardly very good.

Peacemaker (Ref. 34) distinct from the Telephone-like pea later named by Kelway, was introduced by Ebbert about 1906. It was a dwarf (2 feet tall), second early variety, bearing paired pods, slightly curved at tip, with long-rounded ends and small tips, and containing 10 peas. It has been found only in the catalogs of this company, but carried by them until 1925.

Clatawa (Ref. 35) was brought from the Pacific coast by Leonard, some time before 1907. The name, of Chinook Indian origin, means "get up and get." It is said to be earlier and more dwarf than Potlatch; and the latter is a midseason pea about $2\frac{1}{2}$ feet tall. Clatawa has "pods like Telephone."

Dainty Duchess (Ref. 36) is an English pea, brought to the United States in 1907 by Johnson Seed Co.

The variety was grown here from British Columbia seed. Similar to World Record, but not quite as tall, $1\frac{3}{4}$ feet, with much more abundant and darker green foliage, and larger, rounded stipules;

flowers much higher, 14th node; pods $3\frac{1}{8}$ to $3\frac{1}{2}$ inches long, not quite as broad nor as plump, heavy walled and smoother, and rather better filled; peas indented, oval to oblong, very well colored; seeds light bluish green, and bluish white rather than cream. It was ready with Dwarf Telephone, late midseason, and gave a better crop.

Laxtonian Hybrid. Seed of this pea, of unknown origin, was received at the Station from the University of British Columbia and by them from the Dominion Experimental Farm at Sydney. It was half the height of Laxtonian; with pods of almost the same size but more uneven. For the size of the plants it bore as well as Laxtonian and was the same in season.

Mount Rainier. Ref. 38. In 1907 the Mount Rainier pea was already well known and said to be yearly increasing in favor in the State of Washington; but seems never to have been known in the East, and was discarded commercially some time after 1913.

It was a robust, heavy-stemmed variety, 2 to 3 feet tall, and needing support, with rich green foliage; pods, from the illustration given, often paired, on long stalks, straight, somewhat slender but plump, with long-rounded or pointed ends without tips; peas 6 to 10, large, succulent. It was a late midseason or maincrop pea.

Early Duke (Ref. 41) originated with Carter as a Blue Express x Duke of Albany cross, and was introduced, after several years' testing, in 1913.

Except as included by Carter in his American catalogs and as grown at this Station and by the U. S. Department of Agriculture, Early Duke appears unknown in America. It may be called a slightly taller, earlier Discovery, with shorter, plumper, slightly curved pods, and rather fewer, smaller, and lighter colored peas ($3\frac{1}{4}$ to $3\frac{3}{4}$ inches); branches few; foliage less abundant, lighter in fundamental color and more whitened, but the stipules are noticeably darker in color than the leaflets. Season same as Laxtonian, but the yield is poor.

Lancashire Lad (Ref. 43) is an English pea, sent to the Royal Horticultural Society for testing in 1911, by Yates, and later listed by at least two seedsmen. Except in tests at this Station and by the U. S. Department of Agriculture, probably unknown in the United States. One of the dwarfest of the group, less than a foot tall as grown here, tho $2\frac{1}{2}$ feet tall in England, in season with Dwarf Telephone, with shorter and plumper pods, and a better cropper.

Defiance (Ref. 48) was listed by Darling before 1913; but did not originate with them. It seems to differ from any English pea of the name, and is not Laxton's Dwarf Defiance, a Stratagem type pea, tho similar to it in some ways.

Grown in our tests from Idaho Station seed; about 2 feet tall, with a few fairly well-developed medial branches; foliage rather scanty, medium to dark green, with very large leaflets and stipules; flowers large, white, distinctly shaded green, borne from the 13th node up; pods $3\frac{1}{4}$ to 4 inches long, sometimes much smaller, rather narrow for the group, not very plump, long rounded or pointed with dorsal slant, medium green in color, usually well filled, but noticeably hard to shell; peas 4 to 8, large, more or less indented, oval to oblong, yellowish dark green. The seeds were medium green in color. One of the latest varieties in the group, requiring 10 weeks from mid-May sowing; not productive, either with us or at McMillan, Mich., where it was also studied.

MINOR VARIETIES IN ADVANCER GROUP

Princess of Wales (Refs. 4, 5; U. S. Pat. Off. Rpt. (Agr.) 1865) was introduced by Sutton about 1864, and listed in the report on Agriculture of the U. S. Patent Office in 1865, but apparently did not find favor in America. It was grown in England for half a century at least, and was also long known in France. In trials by the Royal Horticultural Society, Princess of Wales, Turner's Wonderful, Carter's (not Sutton's) Prince of Wales and Yorkshire Hero were all considered identical with McLean Favorite.

It was very prolific, like Advancer, but later, with shorter, somewhat broader pods, clustered near top of plant, and very light-colored peas.

Dr. McLean. Refs. 8, 9. Gregory Cat. 1879; S. Dak. Sta. Bul. 91:5. 1905. The Dr. McLean pea was raised and introduced by Turner, about 1875, and named for one of England's most famous pea breeders. It is said to be a seedling of Advancer, resembling it in many ways, but in England considered superior. It was brought to the United States in 1878 but never found such favor here as did Advancer.

Height $2\frac{1}{2}$ to $3\frac{1}{2}$ feet; stems stout, branched; pods often paired from 12th node, bringing them well toward tops of plants,

rather like those of Stratagem, arched but little curved, 3 to 4 inches long, with long-rounded or pointed, tipless ends, whitish green in color, wrinkling early. Season that of Advancer, but pods ripen more slowly.

An Improved Dr. McLean, from entirely different breeding, was introduced by Sutton about 1896, and reached the United States for trial about 10 years later, but, like the older form, has been little grown. It has better pods, larger, with more blunt ends, and more and smaller peas. Both forms were grown here in recent tests and the older one in 1884 also.

Edinburg Beauty. Refs. 10; Rural N. Y., 41:562. 1882; Kans. Sta. Rpt. 2:163. 1890. Edinburg Beauty was advertised in 1881 by two leading English seedsmen; but it seems to have been noticed more frequently in America than in England. It was introduced here, apparently by Cleveland, about 1882. The notices are mainly those of tests at stations, including this one, and on other trial grounds.

An improved Advancer, slightly earlier, prolific; height $1\frac{1}{2}$ feet, stocky, very short internodes; foliage green, leaflets 2-4, rather small, narrow; rather uneven, $1\frac{1}{2}$ to 3 inches long (usually

2 to 2 $\frac{3}{4}$), often paired, sometimes poorly filled, but, when good, with 5 or 6 compressed peas of good quality; two weeks after earliest peas. The "improvement" was evidently in the dwarfness and earliness, as Edinburg Beauty was said to be the "earliest dwarf" wrinkled pea.

Racket (Refs. 13, 14) originated with Horsford in 1879. Racket and Horsford Market Garden came from peas in the same pod, the parents being Alpha and American Wonder.

Racket seems to have been entirely overshadowed by its twin variety, as test records alone remain of it. In plant and foliage it resembled Alpha and in pod Advancer; was no earlier than Advancer and ripened slowly. It sometimes reached 5 feet in height, tho usually 2 $\frac{1}{2}$ to 3 feet.

A 1. Ref. 15; *Gard. Chron.* 12:73. 1892; *Gregory Cat.* 1904. A 1 came from a cross between American Wonder and Paragon, and was introduced by Sutton in 1891. It won a gold medal at the great Temple Show in 1896. It was first listed in America in 1904; but has never won popular favor.

As grown here in recent tests, from British Columbia seed, it gave short, light green pods of Advancer shape, with only 4 or 5 whitish green peas. The plants were more like Alaska than Advancer, having slender stems and scanty, light green foliage with leaflets in 2s and 4s. It flowered low on the stem, about the 8th node, and would have given very good yields had the pods been larger and better filled. It was nearly a week earlier than Advancer.

Oxonian (Refs. 16; *Thorburn Cat.* 1893) was introduced by R. Veitch about 1887 when it received a First Class Certificate from the Royal Horticultural Society. A much later English reference said Oxonian (?) appeared to be a selection from Alpha or Dr. Hogg, and other references note its similarity to Alpha. It reached America in 1893, and was listed by several seedsmen. Our last record of it in the United States dates 1915, but seed of it was obtained from British Columbia in 1922. It was also known in France, being described by both Denaiffe and Vilmorin.

As grown here it was much earlier than Advancer, with scantier foliage and smaller pods containing 4 or 5 small peas of fine quality. The pods were dark green at first, but lost color rapidly even on the plants, tho the peas were much better in color. It was not productive.

Favorite. Refs. 17, 18; *Nebr. Seed Co.*, letter Dec. 6, 1922. Unless Favorite of the first references, which is said elsewhere to be "a very dwarf type of Yorkshire Hero," is McLean Favorite, its origin is unknown. Our first reference says that McLean Favorite and Yorkshire Hero were both identical with the old Princess of Wales. The figures for this Favorite, practically the only data given, make it more dwarf than Princess of Wales.

Favorite of the Nebraska Seed Co. is said by them to have been a sport of Prince of Wales, and quite similar to it. It has been discarded.

Burpee Quality and Burpee Quantity. Ref. 19. Quality and Quantity originated with Arnold, and were introduced by Burpee in 1888. They differed only in height, and yields, Quantity being taller, and supposedly more productive.

Quality, as grown here, was about 2 $\frac{1}{2}$ feet tall, branched, with dark green foliage, flowering low on the stem, about 5th node, and bearing single and paired pods about one-fourth inch shorter than those of Advancer, but very similar in shape, possibly a trifle broader and containing 3 to 5 very large, light colored peas. It was slightly earlier than Advancer, but not as good a cropper.

Seed of Quantity was not found for our tests, and both varieties seem to have practically disappeared.

Childs Morning Star (Ref. 21) is said to have been introduced about 1894.

As tested on the Rural Experiment Grounds in 1899 it was ready for use midway between Surprise and Gradus, produced twice as many pods as Gradus, which were 2 to 2 $\frac{1}{2}$ inches long, round and well filled with small wrinkled peas of good quality. It resisted drouth well. It was probably more dwarf than Advancer.

Startler (Ref. 22) was listed in 1894, without history, by Buckbee. It was a late pea, of Advancer habit of growth, with better colored foliage and pods. The latter were often paired, almost cylindrical, but usually showed more dorsal pointing of the ends than Advancer.

Mayor (Ref. 20) is said to be an English pea, introduced in this country by Henderson, in 1891. Tho tested at various places it

did not equal the early claims for it; and was soon dropped, even by the introducer, for Heroine, Juno, Sharpe Queen and other earlier, larger-podded, more productive peas.

It was 2 $\frac{1}{2}$ to 3 feet tall, with fine-leaved, dark green foliage, single pods 3 to 4 inches long, broad, straight, blunt-ended with large tips, and often poorly filled. When perfect they contained 5 or 6 very large, oblong peas of good quality. It was nearly a week later than Stratagem, late midseason.

C. P. R. (Ref. 22a) is a Canadian pea, introduced before 1901 by Bruce.

It is described as the "best maincrop, blue wrinkled marrow," 2 feet tall, with sturdy, branching stem, large, slightly curved pods, filled with fine, deep green, delicious peas.

An Improved C. P. R. is noted in recent Bruce catalogs.

Gardeners' Favorite. Ref. 23. Griffith & Turner said in 1902 that Gardeners' Favorite was "named and introduced by them," but this probably occurred some time before the date given.

The very scanty descriptive notes and the figure of a pod-laden plant make the variety seem like a stocky, much branched Advancer with pods more rounded at the end, a view confirmed by our tests of it here during three recent seasons, except that the pods are slightly narrower (more slender) than those of Advancer, rather than wider as the figure would indicate, and contain smaller peas. It is later than Advancer, fully as productive, with rather darker foliage but no better colored pods or peas.

Sutton Abundance. Ref. 24. In 1906, Sutton announced as a novelty an Abundance pea. This, from the descriptions given by Sutton and by the Royal Horticultural Society, in whose gardens the pea was several times tested and from whom it received a First Class Certificate, appears to be of Advancer type. The stock was not well selected at first and two strains have developed, one of which is twice as tall as the one originally described.

One of the strains of Abundance grown here seems to be clearly Sutton's pea of the taller-stemmed strain, altho the seedsman from whom we obtained our stock listed Abundance, not otherwise qualified, before Sutton Abundance was announced. Probably a change of stock was made at some time by which one Abundance was unintentionally substituted for the other.

The plant differences between the two peas are slight, but the pods of Sutton Abundance are seldom paired, are nearly an inch longer and proportionately broader, less blunt at the ends and contain larger peas. The seeds also are decidedly larger than those of Advancer. Except for this apparently accidental introduction, Sutton Abundance is probably not known in America.

Vigorosa (Ref. 25), announced in 1906 by Buckbee, is a short-stemmed Advancer.

Height 2 feet; pods very plump, well filled, frequently paired but borne more toward the top of the plant so that the crop is not quite as good as that of Advancer or Abundance, and is slightly later. The pods and peas are rather better colored than those of Advancer and peas larger.

Home Delight (Ref. 26) was listed by Hastings in 1907, as having been grown for several years. His description would not identify the variety, but as grown here it is apparently Advancer, with possibly rather slenderer pods and smaller peas.

Cracker Jacks (Ref. 27) was listed by J. Bolgiano in 1907, but had been grown previously.

As tried here, much like Advancer, later, and not as productive. The pods are decidedly longer, not as plump, and often show tendency to a dorsal sloping to the point, from a distinct enlargement of the pod near the end. The seeds are much larger than those of Advancer.

Pride of Cahuenga (Ref. 28) grew in the Cahuenga Valley, California, before 1908, and attracted attention of a Mr. Wiltfong by its great productiveness. After successive destruction of crops by floods, seed was secured for distribution by Johnson & Musser.

It is shorter than Yorkshire Hero, about 1 $\frac{1}{2}$ to 1 $\frac{3}{4}$ feet, more branching, with very numerous, paired pods, 3 inches long, very plump, almost round in section, sometimes almost saddle-backed, with shallow indentations between the 7-9 large peas, square-ended, with large tips. It was said to be "undoubtedly the best pea ever put before the public;" and was found "most promising" in three years' testing at the Yuma, Arizona, Experiment Farm of the U. S. Department of Agriculture.

Yankton Maincrop (Ref. 29) was introduced in 1909 by Gurney.

About the size of Advancer, said to be 2 feet tall by the introducers, but 2 $\frac{1}{2}$ to 2 $\frac{3}{4}$ feet in our tests; stem moderately stout,

drooping, occasionally with medial branches; foliage abundant, rather large, leathery, dark green, somewhat whitened, with leaflets in 4s and 6s, and sharp-tipped stipules; flowers at the 13th node, in pairs on medium length, heavy stalks; pods paired, $2\frac{1}{2}$ to 3 inches long, of medium width, plump, sometimes slightly saddle-backed, straight, well filled, and blunt-ended with small tips; peas about 5, medium sized, round oval, medium green, of good quality, seeds rather small, round oval, indented or almost cylindrical, well wrinkled, mixed cream and light green in color. The season is about that of Advancer, and the crops good to very good.

Old Colony (Ref. 30) was listed in 1913 by Breck but seems to have been dropped from subsequent catalogs.

It was described as a large wrinkled variety, two weeks later than Mayflower, with vines $1\frac{2}{3}$ to $2\frac{1}{8}$ feet tall, bearing large pods containing 7 or 8 peas; and the figure given shows the pods to be of Advancer type.

MINOR VARIETIES OF STRATAGEM GROUP

John Bull. Refs. 6; *Jour. Hort.*, n. ser. 3:137. 1880; *Mass. Hort. Soc. Trans.* 170. 1882. From a Veitch Perfection x Prolific Longpod cross, Laxton secured this Stratagem-like pea which he advertised in 1880. This was brought to America in 1882 and listed by several American seedsmen for 10 years.

It was grown at the Station in 1884; much taller than Stratagem, 2 to 3 feet, more branched, with foliage less whitened; pods often paired, decidedly longer, 3 to $4\frac{1}{2}$ inches, slightly curved, lighter in color, with rather fewer and larger peas to the pod, which were whitish green in color, flattened but not compressed. It was very late, ripened gradually, and moderately prolific. This was called both a "taller Stratagem" and a "dwarfer Telephone." It was similar to Sharpe Triumph and some authorities give the names as synonyms.

Another John Bull, a Senator-like pea, was later introduced by Carter.

Pride of America (Ref. 9) was received from Carter and grown at the Rural Experiment Grounds in 1886; but no other references to the variety have been found either in America or in England. Resembled Stratagem but about 10 days later, producing very large peas of Stratagem quality.

Astonisher. Ref. 10. Benham's Astonisher was tested at the Rural Experiment Grounds in 1892 and found "like Stratagem."

Majestic (Refs. 13; Thorburn *Cat.* 1908) was introduced in 1898 by Carter and reached America 10 years later. An improvement on Stratagem, with larger, dark green pods, but taller and a few days later.

Nott Prolific. Ref. 14. This Prolific originated with Nott about 1899, from an Alaska x Prince Edward cross. Said to have the hardiness of Alaska and the size and sweetness of peas of Prince Edward.

Probably belongs in the Stratagem group, tho the plants were taller, pods larger and peas more numerous, 7 to 9. An early mid-season variety, not specially productive but reliable under practically all conditions. In quality it probably ranked with Stratagem, not equal to the best wrinkled peas, but better than any smooth-seeded one.

Ambler Magnum Bonum (Refs. 17, 18) was tested by the Royal Horticultural Society of England in 1901; and in 1902 was received for testing in the United States from F. Ambler, Winnipeg, Manitoba, Canada.

Apparently a good Stratagem-type pea; height $1\frac{1}{2}$ to 2 feet; foliage and pods deep green; latter paired, long, straight, well-filled; peas 6 to 8, immense, light green, of highest quality; medium early.

Battleship (Refs. 19; and *S. Dak. Sta. Bul.* 91:5. 1905) was introduced by Carter before 1902, when it was tested by the

Delicacy (Ref. 31) was first listed by Sutton in 1922, and has been grown in this country only in an experimental way. It was said to have all the good points of A 1, with greater vigor, and better crops of larger, darker colored pods.

As grown here it was only 2 feet tall; flowered at the 9th or 10th node; the pods were short, plump, square-ended, contained about 5 very large, well-colored peas, and were ready for use several days before those of Advancer. It gave very good crops.

Boston Wrinkled, of unknown origin, was grown at the Station from seed sent by the University of British Columbia, the variety coming to them in 1919 from the Central Experimental Farm, Ottawa, Canada.

It was of very good Advancer type, decidedly later, and produced good to very good crops of slightly larger, very plump, firm pods of fair color, as were the 5 to 7 moderately large peas.

Royal Horticultural Society. It is said to come from a cross between Thos. Laxton and Duke of Albany. It was tried in America in 1904, and recently by the United States Department of Agriculture at McMillan, Mich., and at this Station.

Height in England, 5 feet, here only 3 or 4 feet; stem stout, unbranched; foliage deep green, coarse, much whitened; flowers large, greenish white, from 10th to 12th node; pods singly or rarely in pairs, on long slender stalks, 3 to $3\frac{1}{4}$ inches long, broad, straight, very blunt ended with large tips; peas about 5, very large, light green, of good but not the best quality. It is a midseason pea, but lacks productiveness in America.

Livingston First Choice (Ref. 23) was introduced in 1906.

Height about $1\frac{1}{4}$ feet, foliage medium green; pods like those of Stratagem in color and size, "very numerous;" peas large, dark green and of fine quality. This appears to be different from Vick First Choice.

Rent Payer (Ref. 24) was sent to the Royal Horticultural Society for testing in 1910 by Jas. Veitch when it was found to need more selection, showing many tall, weak stems.

In 1923 the stock was much better. Height 2 feet; stems stout, foliage dark green; pods single or paired, $3\frac{1}{2}$ inches long, straight, broad, pointed, dark green in color; peas 5 to 7, large, fairly sweet, wrinkled. As grown here from English seeds, coarser in foliage than Dwarf Defiance; pods from 8th node on long thick stalks, $2\frac{3}{4}$ to $3\frac{1}{8}$ inches long, quite uniform. It was said by various English authorities to be an "improved form of Stratagem type," and "Dwarf Defiance." Here, as late as Stratagem and only a fair cropper.

Another Rentpayer was noted at McMillan, Mich., on U. S. Department of Agriculture plats, of which pods were sent here when ready, late in the season, and found to be unlike those on Rentpayer. The McMillan variety was apparently Brownhill's Rentpayer, with Telephone-like pods, described elsewhere. The similarity of names makes it difficult to say which of these varieties is referred to in American catalogs.

De Giorgi Model (Ref. 25) was listed in 1914, apparently as new, and was grown here for three seasons.

Dwarf, $1\frac{1}{2}$ feet; stem stout, branches few or none; foliage medium green, with large leaflets and slightly larger, whitened, round-tipped stipules; flowers begin as low as on any variety studied, about the 3rd node; pods single on short stalks, large for dwarf plants, $3\frac{1}{8}$ to $3\frac{1}{2}$ inches long, not very broad nor very plump, straight, rounded to blunt at the ends, with small tips; peas 5 to 7, medium sized, oval, light green to medium green. Seeds well-wrinkled, weigh about 100 to the ounce, mixed cream and light green in color. It is an early midseason variety, but not very productive in the North, tho said to yield heavily in the Mississippi Valley.

MINOR VARIETIES IN CHAMPION OF ENGLAND GROUP

Hairs Dwarf Marrow. Refs. 14-18. Much confusion of names and synonyms exists between the various Green Marrows, since very similar names were applied in and just before 1850 to Knight Marrows and their derivatives and to a smooth green pea, similar in type to the American white marrowfats. Hairs Dwarf Green Mammoth Knight Marrow, here described under a shorter name, appears to have been first advertised in 1850 by Duncan Hairs, and was an improved Knight Dwarf Green Marrow, or an intentional or accidental cross with that variety as one parent, as it had decidedly larger pods, and was nearly two weeks earlier, the

original being the latest of the Knight peas. Hairs' pea was brought to America in 1856 by the United States Department of Agriculture, listed commercially in 1858, described by Burr in 1863, and was still listed in 1892 after which Gregory replaced it with Delicious. It is no longer grown in America unless the Dwarf Green Marrowfat of a few southern seedsmen is this variety.

It was hardy, strong and vigorous in growth, low and bushy in habit, with dark green, whitened foliage; pods singly or in pairs, 12 to 16 to the plant, broad, slightly curved, blunt-ended, larger than those of Knight Dwarf Green Marrow, comparatively flat, and con-

taining 6 or 7 large, compressed, sweet peas, changing to cream or bluish green seeds. It was ready in midseason and very productive.

It was grown at the Station in 1883 and 1885, but only summaries were printed of the extensive notes taken. These notes show the variety very similar to Knight Dwarf Green Marrow, with paired pods, longer and better filled than those of the older variety, making it very prolific.

King of the Marrows. Refs. 19-23; U. S. Pat. Off. *Rpt.* (Agr.) 1865; Evans *Cat.* 1868; Hogg *Gard. Yr. Bk.* 14:109. 1873. Waite's King of the Marrows was advertised by Sutton in 1854 as new. It was listed by the U. S. Department of Agriculture in 1865, and commercially in 1868. It was still cataloged in the United States in 1889, but not found in seedsmen's lists of 1901. Hogg, in 1873, gave King of the Marrows only as a synonym of Tall Green Mammoth.

It was a very tall, late pea of the Knight Tall Green Marrow class but with much larger pods and larger, greener seeds. An early reference notes its resemblance to Ne Plus Ultra, but later ones say it is very like British Queen (of Knight Tall White Marrow type), but with green seeds. A French description shows the foliage to be similar to that of Champion of England; and says the pods are square at the end. It was a prolific variety yielding over a long period.

Monarch. Refs. 22, 23; *Country Gent.* 17:143. 1861; Hogg *Gard. Yr. Bk.* 14:109. 1873. Monarch was advertised in 1856 by Hurst, who had purchased the stock for that year from Epps, the originator. The Royal Horticultural Society said in 1860 that the variety was the same as Tall Green Wrinkled Mammoth, with which King of the Marrows was also said to be identical; but references to both Monarch and King of the Marrows are found preceding any to Tall Green Wrinkled Mammoth. Probably all three varieties originated at practically the same time through the selection by different growers of similar variations in Knight Tall Green Wrinkled Marrow. Monarch was advertised in America as "new" in 1861 by at least two firms. Monarch was considered by Hogg, also, only as a synonym of the variety below.

Tall Green Mammoth. Refs. 20, 21, 23-26. Except for its use as a synonym in a reference dated 1857, the first notice of Tall Green Mammoth, in 1859, gave no indication of its previous history.

Of the group of three varieties regarded as identical, of which this variety is the last, only this has been grown at this Station, in 1884; but the other names are given as synonyms. It was not found in American seedsmen's catalogs.

It appears to have differed very little, under American conditions, from Knight Tall Green Marrow, was of the same height, but had longer internodes, darker green foliage, and rather longer pod stalks. The pods were apparently of the same length but narrower and plumper, light green in color, and contained fewer peas, on the average, which were slightly larger. The seeds were very pale green or almost white, and much wrinkled. It was earlier

than the original Knight's variety, and much more productive, ripening over a long season.

Fairhead Excelsior. Refs. 28; Hogg *Gard. Yr. Bk.* 14:107. 1873. This pea is credited to Fairhead, before 1859. In 1860 it was pronounced identical with Climax by a committee of the Royal Horticultural Society; but was probably, like Napoleon, distinct in origin tho horticulturally indistinguishable from Climax. Hogg considers it synonymous only. It was brought to America in 1862 and found decidedly early, taller than Climax or Napoleon, and a poor producer of very good peas.

Popular. Refs. 30; Thorburn *Cat.* 1873; Hogg *Gard. Yr. Bk.* 14:107. 1873. Popular originated with Laxton, about 1871, but was distributed by Hurst. It reached America in 1873; but here never justified its name.

It was apparently much like Champion of England, rather slender, earlier and more productive, light green, with long, rather narrow pods, much curved, pointed, and well filled with large peas. Hogg considered it better than Climax.

Commander in Chief (Refs. 31; N. Y. Sta. *Rpt.* 3:248. 1885) was introduced about 1875 by Carter and was brought to America two years later. It was grown at this Station in 1882 and 1884, but never became widely known.

From the descriptions given, Commander in Chief can hardly be separated from Champion of England; but was probably less branched at midstem, with rather deeper green foliage; pods usually single, slightly curved, and better filled with smaller peas, changing to rather small seeds with a bluish shade in the cream or light green coats. It was not as prolific as Champion but otherwise similar in cropping habits.

Kelvedonian (Refs. 32; Veitch, J. *Cat.* 1907) originated prior to 1903, probably with Hurst. English references to the pea are few, but it was listed by two or more seedsmen for at least 20 years. The 1903 reference is an American one, and the variety was tested quite extensively in this country but never much grown.

It was of dwarf Champion of England type, $2\frac{1}{2}$ to $3\frac{1}{2}$ feet tall in America and somewhat taller abroad; pods paired, starting rather low on the stems, 11th or 12th node, longer and broader than those of Champion, straight, and square ended. It was rather earlier than Champion and decidedly more productive.

Scotch Champion (Refs. 33; S. Dak. Sta. *Bul.* 91:7. 1905) is placed in this group by the name. It was said to be new in America in 1907, but was grown in U. S. Department of Agriculture tests in South Dakota in 1904. It is a cross between Windsor Castle Marrowfat and Dr. McLean, and is very popular in Scotland and Ireland; so it is undoubtedly an old variety. It may be Champion of Scotland, described under Wrinkled, Cream-seeded Group.

It was 3 to $3\frac{1}{3}$ feet tall, very prolific, with "stout" pods 4 inches long, ready in late midseason; peas about 6, of medium size, good color and flavor, medium in sweetness and juiciness.

MINOR VARIETIES IN NE PLUS ULTRA GROUP

Lord Raglan. Refs. 14; Thorburn *Cat.* 1861; Hogg *Gard. Yr. Bk.* 14:109. 1873. This pea was selected from Hairs Dwarf Mammoth in 1852, and offered for sale in 1854 by Epps. It reached America in 1861, but never gained favor. Tho hardly of Ne Plus Ultra type, Lord Raglan is included here because of its resemblance to Veitch Perfection.

It was only about half as tall as Ne Plus Ultra, much earlier and more prolific, tho not as early as Dwarf Mammoth, with pods fully as long or longer than Ne Plus Ultra, slenderer, and almost scimitar shaped, and peas smaller and not as good in quality. Hogg says it was intermediate in season between Hairs Dwarf Mammoth and Veitch Perfection, but unworthy of growing because of poorly filled pods.

Omega. Refs. 21; Thorburn *Cat.* 1873; N. Y. Sta. *Rpt.* 3:262. 1885; Hogg *Gard. Yr. Bk.* 14:103. 1873. Omega originated with Laxton about 1872 from a Veitch Perfection x Ne Plus Ultra cross. It was listed in America in 1873, and was tested here in 1884. It was essentially a dwarf Ne Plus Ultra growing 2 to 3 feet high, a few days later and with less blunt-ended pods. It was prolific, and the pods kept fresh well after picking.

Hogg mentions a Progress pea, also Laxton's, from the same parents as Omega, which was a day or so earlier and had smaller pods, but was in every other way similar to it. This is not the Progress pea recently introduced by Laxton Brothers.

Laxton Connoisseur (Refs. 23; *Rural N. Y.* 34:174. 1875), which seems to be distinct from the Cooper-Taber Connoisseur listed by Ferry, originated with Laxton about 1874 from a cross between Ne Plus Ultra and Evergreen. It was evidently very much like Ne Plus Ultra, but with rather smaller, slightly more curved pods, keeping in season longer, and with smaller, deep green seeds.

Little Wonder (Refs. 24; Gregory *Cat.* 1878) was introduced in England in 1878 by Carter, with whom it undoubtedly originated, and Gregory listed it in America in the same year.

As described, and as grown here in 1884, it was a dwarf, earlier and better podded G. F. Wilson. It is distinct from Loudon's Little Wonder, which was under 1 foot in height and bore small, white, round peas. This latter was probably never grown in America.

Paragon. Refs. 18; Gregory *Cat.* 1894. Dickson's New Paragon was considered, in 1866, the same as Veitch Perfection, previously described.

Under a rather different name, Hogg says plants resembled those of Bishop Early Dwarf, 2 to $2\frac{1}{2}$ feet tall, robust, branching, bearing many fine, deep green pods, filling poorly, in season with Paradise Marrow and Bishop Long-podded.

Sharpe Paragon, or Early Paragon, originated with Culver-

well, and was introduced about 1882 by Sharpe. It reached America in 1885 and was grown at this Station in 1888.

It was very much like *Ne Plus Ultra*, but earlier; with pods appearing plumper, but inflated ("puffy"), so the peas were no larger nor were they compressed. English descriptions say the pods were 2 or 3 in a group; but in the Station test they were "not numerous," and were borne high on the stems. (See *Magnificent*, described beyond.)

In 1894, 1895 and 1896 several American seedsmen listed a *Paragon* pea, said to have been introduced by Grenell, and to be new; but the descriptions given are too fragmentary to say that this was not a reintroduction of Sharpe *Paragon*. If they were different, the American variety, of unknown parentage or breeding, was rather shorter stemmed; with stockier, almost cylindrical, better filled, blunt-ended pods, and more productive.

At least two other *Paragon* peas are recorded in English pea literature and two more, of field pea type, in America.

Perpetual Bearing (Refs. 30-33), probably better known as *Walker Perpetual*, was selected from *Veitch Perfection* by Walker, and distributed by Nutting about 1881. It is called a white-seeded *Veitch Perfection*, and said apparently to reproduce *Premier*. As Latest of All was called a selection from *Premier*, it is evident that the two continuous bearers were very similar; but our comparisons of the two varieties show Latest of All rather better, having larger pods and peas, better colored and with more green specimens among the seeds. The pods of *Perpetual Bearing* were more often curved, like those of *Premier*.

Eckford Perpetual (*Ne Plus Ultra* x *William I*), introduced about 1883 and said to be superior to *Perpetual Bearing*, probably never reached the United States; nor did a *Perpetual Bearer* sent to the Royal Horticultural Society by Barr and given XXX in 1917, unless this is an improved form of the *Walker* pea, from which it differs in greater height, longer pods, and earlier bearing. It ripened too early to be included in the late pea group.

Magnificent. Refs. 34; S. Dak. Sta. *Bul.* 91:1905; Portland Seed Co. *Cat.* 1909. This *Magnificent* originated with *Eckford* before 1883, as a *Telephone* x *Ne Plus Ultra* cross. It received a First Class Certificate from the Royal Horticultural Society in 1884. English references say it is only slightly different from Sharpe *Paragon*, being later, and with square-tipped pods. These points, with its rather shorter pods, place it in this group rather than with the *Telephones*. It was tried in South Dakota in U. S. Department of Agriculture tests in 1904, and introduced in the West in 1909. Seed from which it was grown here, recently, came from the Idaho Station. Since it was not possible to secure an accurate description of *Paragon*, it may be well to give the leading characteristics of *Magnificent*, especially those which separate it from *Ne Plus Ultra*, as both were grown here in the same seasons from seed from the same sources.

Height of *Magnificent*, 3 feet (*Ne Plus Ultra* 4½), with short internodes and more basal branches; foliage dense and dark green with bluish tinge from heavy bloom on stipules, leaflets in 4s, almost never in 5s, and larger, stipules larger, more whitened and more glaucous; pods begin rather higher on the stems, very rarely paired, slightly longer and more uniform, generally above 3½ inches, occasionally slightly curved, better filled to the more abrupt ends; very dark green and very heavy-walled; peas averaging one more, 4 to 7 or 8, dark green, very smooth, long oval in shape, and occasionally indented by compression; seed differences very slight, tho *Magnificent* varied more in wrinkling, from almost smooth to well wrinkled. Season and productivity of the two varieties were similar, late and moderately productive.

The *Magnificent* pea, raised by W. Johnson, and tested at Wisley in 1922 and 1926, when it was given "H. C.," is unknown in America.

Sander Marrow. Refs. 35; N. Y. Sta. *Rpt.* 7:137. 1889; Kans. Sta. *Rpt.* 2:165. 1890. This pea originated with Sander about 1883, and came to the United States for testing in 1888 and commercially in 1892. It was popular for a time in both England and America, but has now disappeared.

Height 4 to 5 feet or more, rank in growth but rather short-jointed, much branched above; foliage large, coarse, light green marbled with white; leaflets 2-6, broad, obtuse, faintly toothed; subject to mildew; pods borne toward top of stem, sometimes paired, 3 to 3½ inches long, straight, blunt-ended, paler than foliage; peas 3 to 5, huge, of fine quality; month later than earliest kinds.

Anticipation (Refs. 37, 38; N. Y. Sta. *Rpt.* 6:331. 1888) was introduced by Carter before 1886, and is said to come from a cross between *Ne Plus Ultra* and an early, wrinkled, dwarf pea. It was tested at various American stations, including this one, between 1887 and 1894, was "condemned with faint praise," and apparently never regularly cataloged here.

From the partial descriptions given, it was quite dwarf, occasionally 4 feet, stout-stemmed, sometimes branched, with light green or bluish green foliage, and paired pods, 3 to 4 inches long, straight, broad, with blunt ends, light in color, and containing 4 to 8 large, oval, medium green peas of excellent quality. It was apparently a little earlier than *Ne Plus Ultra*, and fairly productive.

American Beauty (Ref. 39) probably originated with Alexander, by whom it was sent to this Station for testing in 1887. Descriptive notes are meager but it evidently is much like *Anticipation*, with the pods somewhat constricted between peas, large and less blunt, even when well filled, than others of the group.

The Don (Refs. 40; Mich. Sta. *Bul.* 79:21. 1892), originated by Eckford, was sent, as *Quality*, to the Royal Horticultural Society for testing in 1888, received a First Class Certificate, was renamed, and was introduced the next year. It was brought to America in 1891. Tho a good pea, it was never widely known or grown on either side of the Atlantic. The brief descriptive notes do not give enough characteristics to separate it from *Ne Plus Ultra* or others of the group; but it was said to fill a vacancy in the season, coming between the second early and main crop varieties.

Sutton Matchless (Ref. 41) received a Certificate of Merit from the Royal Horticultural Society in 1890, and the old or an improved form was several times after that mentioned in their Journal, but does not seem to have been much grown. Probably grown in the United States only in tests of the U. S. Department of Agriculture and of this Station, in the latter from British Columbia seed.

More dwarf than *Ne Plus Ultra*, 2 to 2¾ feet; stem stouter; foliage dense, medium green, consisting of very large leaflets and stipules, considerably whitened and the latter with heavy bloom; pods from 14th or 15th node, occasionally paired; almost like those of *Ne Plus Ultra* in size and shape, usually not well filled and with rather less blunt ends; peas 4 to 6, large, oval to oblong, whitish green, seeds decidedly larger than those of *Ne Plus Ultra*, about 75 to the ounce, very broad oval and much flattened. Season and yields were about like those of the type variety.

Apparently not *Matchless Marrowfat* of Sutton, from which name *Marrowfat* was later dropped (p. 100).

Chelsonian (Ref. 42) probably originated about 1890 with Jas. Veitch; did not gain special commendation from the Royal Horticultural Society when first shown, but later was said to be an early, selected form of *Ne Plus Ultra* with all the latter's good qualities. It was not very popular; and was never in commerce in the United States but was grown at the University of British Columbia and at this Station from British Columbia seed.

Here, taller than *Ne Plus Ultra*, 5 feet; foliage darker, with leaflets occasionally in 3s only; flowers higher up the stem; pods were flatter, poorly filled, occasionally having only 2 peas and rarely more than 6; both pods and peas of good color and peas of excellent quality; the seeds very attractive,—mostly bright deep cream with some green shading. It was neither earlier nor more productive, under our conditions, than the older variety.

Goldfinder (Ref. 44) originated with R. Veitch before 1894; was grown many times in the gardens of the Royal Horticultural Society, but until 1925, when "highly commended," was evidently regarded as too similar to *Ne Plus Ultra* to merit a separate commendatory award. So far as known, it has been grown in America only in the U. S. Department of Agriculture tests, and at this Station from English seed.

It differed from *Ne Plus Ultra* in greater vigor, stouter stem, darker foliage, pods more uniform and averaging larger, plumper, very blunt at the ends, and much better filled, usually with 7 peas, almost square thru compression, and of very fine quality. A few pods were ready much earlier than those on *Ne Plus Ultra*, but a long time was needed to secure the good to very good crops.

Grant Favorite (Refs. 45, 46) was introduced by Buckbee about 1894; and probably listed only by that firm.

As grown here, a dwarfer *Ne Plus Ultra*, 2½ to 3 feet tall; stems rather stout, somewhat branched; foliage dark, slightly whitened and somewhat glaucous; pods occasionally paired, from 14th

or 15th node, quite uneven in length, 3 to 4 inches, not well filled and rounded rather than blunt at the ends; peas 6, large, almost square thru compression, dark green in color and of good quality. The variety is about the same in season as Ne Plus Ultra and only fair to good in yields. It is also now quite variant in type, probably through lack of sufficient care in growing the seed. Some older records indicate an earlier season and greater productivity.

Wood Acme. Ref. 47. Acme was introduced in 1895 by Wood & Sons, and apparently has been listed only by them. From the descriptions and data given it was probably of Ne Plus Ultra type; and in a West Virginia Station test was heaviest in total yield and second in yield per plant of 35 varieties grown. There it was 2½ feet tall, and ready in midseason. This is distinct from the Wisconsin Station canners' pea, Acme.

Late Queen (Ref. 48) was introduced by Sutton in 1895, as superior to Latest of All. Probably not handled commercially in the United States but was grown in our recent tests from British Columbia and English seeds. It proved, here, a dwarfier, larger podded Ne Plus Ultra, not noticeably later than that variety.

Capt. Cuttle. Refs. 49; *Roy. Hort. Soc. Jour.* 48:91. 1923; *Leonard Cat.* 1913. Capt. Cuttle was raised by Holmes before 1897, when the variety received an Award of Merit from the Royal Horticultural Society. It has been considerably grown in England, even recently; and was introduced into the United States in 1913 but did not gain a permanent place. Capt. Cuttle was tested by the U. S. Department of Agriculture in 1904 before its introduction, and again in their recent tests, from which seed was secured for growth at this Station, in 1926. English comparisons associate Capt. Cuttle with Duke of Albany; but in our tests the pods were much more like those of Ne Plus Ultra, having rounded to blunt ends, tho they sometimes lack the distinct tip which characterizes that variety.

Plants nearly a foot shorter than those of Ne Plus Ultra, 2¾ to 3¾ feet; stems stouter, usually unbranched; foliage abundant, fairly dark, consisting of very large, slightly glaucous but not whitened leaflets in 5s and 6s, and still larger stipules, decidedly whitened and quite glaucous; flowers very large, white, with green at the base, from 15th node, more frequently paired than single, on rather short, heavy peduncles; pods appear somewhat slenderer than those of Ne Plus Ultra, but average rather longer, 3½ to 4 inches, generally quite well filled; peas averaging 5 or 6 from 8 ovules; large, round to indented, short, oval, dark green in color and of very good quality, tho slightly mealy; seeds much like those of Ne Plus Ultra, the recent improved type of Ne Plus Ultra, but have a distinct bluish shade, especially noticeable in the cream colored ones. The season is about that of Ne Plus Ultra, but the crop was very much better.

Continuity (Ref. 50) was introduced in 1898 by Sutton, but has never been used in the United States, tho grown recently in our tests, from British Columbia seed.

It is evidently a variant pea, especially in stem length, since English references give the height as from 3 to 6 feet, and in our tests the plants were but little more than a foot tall. Except for the height, it is of Ne Plus Ultra type and of about the same season. It is said to bear heavy crops under normal conditions.

Reliance (Refs. 51; *Henderson Cat.* 1901) was introduced by Hurst about 1898, came to America in 1901, and seems to have become as well, or better, known here than in England, tho not especially popular in either country. It was still listed in England in 1925; but not found in recent American catalogs, so was not included in our tests.

MINOR VARIETIES IN TELEPHONE GROUP

Invincible. Refs. 10-13; *N. Y. Sta. Rpt.* 7:138. 1889. Sharpe Invincible was a Veitch Perfection x Essex Rival cross, originating previous to 1878 with Culverwell, introduced in that year by Sharpe, tested at this Station in 1888 and sold in the United States in 1889, but was probably never widely grown.

Smaller in every way than Telephone, 3 to 3½ feet tall; pods similar in shape or slightly more slender, half an inch shorter; peas as many, or more, smaller; seeds greener. As the pods were often paired and occasionally in threes it was more prolific than Telephone, and was earlier. It could not compete with Telephone in popularity because of the latter's showy pods.

Sutton Invincible, introduced in 1893, was another Culverwell cross-bred pea originating in 1884. Probably not distributed com-

mercially in the United States, but it has been grown at this Station for three years from British Columbia seed.

It appears to have been an especially vigorous, hardy, mildew-resistant, rather early strain of Ne Plus Ultra, with shorter, better filled, somewhat wrinkled pods. The foliage was light green in color, and the pods medium, or "fresh," green.

Prince of Peas (Refs. 53; *S. Dak. Sta. Bul.* 91:7. 1905) originated with Culverwell, and was introduced in 1899 by Sutton. It was said to be of Duke of Albany type, but distinct; and the blunt-ended pods, in the opinion of the Royal Horticultural Society Committee, classed it as an improved Ne Plus Ultra. It has been grown in the United States, so far as known, only in the U. S. Department of Agriculture tests.

Midseason variety, with 10 or more 3½-inch pods to the vine, each with 5 to 7 large, oval peas of good flavor and texture but medium in color and sweetness. English references make it about as tall-stemmed as Ne Plus Ultra, earlier in season, and a better producer of larger pods and peas, not of specially good color.

Lord Roberts (Refs. 54; *S. Dak. Sta. Bul.* 91:7. 1905) was introduced by Sutton in 1902; and has probably been grown in the United States only in tests.

It is 2 to 3 feet tall, with habit like that of Stratagem; but the handsome, long, massive, broad, almost straight, dark green pods with square ends are those of Ne Plus Ultra. It is a late midseason pea, and quite productive, even in America.

Censor (Ref. 55) originated with Eckford before 1906. Altho it received "full marks" from the Royal Horticultural Society, it never gained a noteworthy place in England; and is unknown in the United States except in tests of the U. S. Department of Agriculture and this Station.

It resembles Capt. Cuttle, but is shorter stemmed, 2 feet, with lighter colored foliage, leaflets in 4s and smaller, similar large flowers borne two or three nodes lower, and with pods less often paired. The pods are very similar to those of Capt. Cuttle, possibly more often with a slight curve and usually longer rounded at the ends which results from a slight lessening of the average number of peas. The peas are of the same color and size, but the seeds are more flattened. The season of the two peas is apparently the same, but Censor did not yield as well.

Maryland Pride (Ref. 59) was introduced in 1909 by Griffith & Turner and they, alone, seem to list it. It was grown at this Station in our recent tests; and was very much like Thomas Laxton.

Pods of Maryland Pride were not quite so blunt at the ends, and the larger, darker green peas wrinkled so much in ripening that they weighed a trifle less than those of Thos. Laxton. If there was any difference in season, Maryland Pride was a day or so earlier; both gave good crops.

Longstander (Ref. 61) was introduced by Sutton in 1913, and was grown here from British Columbia seed. Our test was not very satisfactory because of late planting and long season required for maturing pods, 75 days from planting on May 22nd; but the data secured agreed, as well as could be expected under our conditions, with Sutton's description:

Follows Ne Plus Ultra in season, and of same type, 6 feet tall, with larger and broader pods of fine dark color.

Dreadnought (Refs. 60; *Allen, Sterling & Lothrop Cat.* 1913) was introduced by Carter shortly before 1910, and was brought to America in 1913. It is still listed and said to be very popular in northern England.

Height, 3 feet; foliage rather scanty, dark green, pods paired, of similar color, from 3 to 4 inches long, of Ne Plus Ultra type, but with a distinct, incurved notch on the dorsum just back of the tip; peas 6, large, dark green, of "delicious flavor;" seeds well wrinkled. It was a late but quite productive variety.

Very like Telephone in all important characters but height, only 2¼ to 2½ feet; foliage finer; leaflets and stipules both small; average pods not quite as long, nor as plump, and of poor color, being decidedly whitish. Somewhat later than Telephone, about second midseason, and possibly produces more pods.

Queen (Ref. 18) originated in Wisconsin before 1884. It is a Telephone-type pea.

About 5 feet tall, with paired pods, rather short for the type, ready in 73 days from sowing made April 25, yielding well and giving a large percentage, by weight to pod weight, of peas which remained bright, lively green when cooked, sweet and tender.

Duchess. Refs. 23-25; Mich. Sta. *Bul.* 70:15. 1891; Farquhar *Cat.* 1911. Duchess originated with Abbott, and was introduced by him in 1887. It was a Duke of Albany x Veitch Perfection cross. It was so similar to Duke of Albany that the name is often considered merely a synonym of the early variety. Abbott considered it quite distinct, its dark green, paired pods, with beautiful bloom, and its earliness, making it better than Duke of Albany; and it received the only First Class Certificate given peas by the Royal Horticultural Society in 1888. It was tested in America in 1890 and 1903 and listed commercially in 1911 but seems not to have displaced Telephone or Duke of Albany.

American Champion (Ref. 26) is seemingly Duke of Albany introduced under the changed name in 1887 by Henderson, just as Gradus became Henderson's Prosperity.

As grown here in 1887 and 1888 it was considered the same as Telephone, or Telegraph with wrinkled peas; and from our recent trials its description checks almost point for point with that of Duke of Albany, tho the Champion strain seemed to have a few branches, rather smaller stipules, and slightly shorter pods. A general note said, "Telephone type, but pods and peas greener."

Midsummer (Refs. 27, 28) appears to be an American pea, as Daniels' Midsummer Marrow, an English pea, is too dwarf and too early to meet the descriptions of Henderson's Midsummer. The latter was introduced in 1888, was tested at various stations, including this one, and appears to have found some favor.

The earlier descriptions of Midsummer make it heavy-stemmed, dark foliaged, about 3 feet tall, with paired pods, paler than foliage, slightly recurved, 2 or 3 inches long, blunt-ended; productive; late. These characters would exclude it from the Telephone group.

As grown here recently, Lohrmann's Midsummer differed, in some respects, not only from Henderson's Midsummer but from Lohrmann's own catalog description.

Plants from one lot of seeds varied greatly, but were similar to short Telephones, while those from a second lot were much taller and more branched; foliage of both strains darker than that of Telephone, and often with only two leaflets; pods of Telephone type, but short, and each with a distinct, small recurved tip; which Telephone pods lack, and more curved at the point than those of the old Telephone.

The better strain was certainly of the Telephone type; so both Midsummers are included in the group.

Duke of Edinburg (Ref. 33) was tested at this Station in 1891. It appears to have been a rather short-podded, very prolific Telephone.

Colossus (Refs. 34; Northrup, King & Co. *Cat.* 1913) originated with Eckford, the noted English sweet pea breeder, prior to 1891, but was not listed in America until 1913. Quite popular in France. It was grown here during three recent seasons.

A rather tall, slightly branched Telephone, flowering at about the 17th node (12th in France) and producing beautiful 4 to 5-inch pods, darker in color than Telephone, not always well filled, but averaging more peas to the pod and yielding as well, sometimes better, tho not as heavily as the best of the group.

Empress of India (Ref. 37) was a contribution to the Telephone group by Sutton about 1892, from a Sangster No. 1 x Telephone cross. Grown in the United States experimentally at South Dakota Station in 1903 and here in 1922-24 from British Columbia seed.

The Sangster influence apparently shortened the stem and pods and lightened the foliage, pods and peas; flowers much lower on the stem, 9th to 10th node; pods more cylindrical than those of Telephone; peas fewer in number and smaller; crops better.

Sutton Exhibition Marrowfat. Refs. 38; Farquhar *Cat.* 1910. This Sutton pea, introduced about the same time as Empress of India, is very similar to Telephone, hardly separable from it by any descriptions given, but as grown here, more closely resembling Duke of Albany in pods, these being even larger and with peas of as good or better quality. Our seed came from British Columbia.

It was several years in reaching America, 1910, and has never been widely grown. It is distinct from Veitch Exhibition Marrowfat, Carter's Exhibition, and Salzer's Giant Exhibition.

Epicure (Ref. 39), a tall pea of the Telephone class, was put out by Eckford in 1893 and received high commendation by the Royal Horticultural Society. References without descriptions in

American periodicals after 1895 may have been to this pea, but more probably to Early Epicure, a very dwarf, short-podded pea of the Gem type.

Eckford's Epicure grew 5 or 6 feet tall, having very large, deep green, pointed pods, containing 9 to 12 peas of high quality, ready in late midseason, retaining their deep green color in cooking; seeds deep green, wrinkled.

Goliath. Refs. 40-42; Simon *Cat.* 1913, also letter from Simon, March 9, 1927. Cooper-Taber found in 1884, in a sowing of Telegraph, the original plant of Goliath, introduced in 1886. It was listed in the United States in 1913, but never much grown. It may belong here or with the dimpled-seeded group, one reference classing it as "a round-seeded form of Telephone, distinct from Telegraph;" and another saying "seeds wrinkled."

Plants of the same height as Telephone, more robust and more often branched; pods larger and more numerous; peas larger and more wrinkled than those of Telegraph, rounder than those of Telephone. The season was the same.

The Simon letter says their Goliath was supposed to be an improved strain of Alderman, with larger pods, but less prolific. As grown here these characters were exactly reversed. The peas however, were very large, and the mixed cream and green seeds quite well wrinkled.

Magnum Bonum Marrowfat (Refs. 43; Tait *Cat.* 1922) was introduced by Sutton in 1893 as a useful, productive maincrop pea, much like Exhibition Marrowfat. It is also a good exhibition variety.

Pods long, straight, broad, long-rounded, of finest form and color, with dense bloom; peas 8 or 9, large, of excellent quality. Pod shape places the variety in the Telephone group, rather than in the Ne Plus Ultra or Stratagem groups with the other Magnum Bonums.

It is undoubtedly this pea, rather than older Magnum Bonum that Tait has reintroduced, as shown by the pods in our tests, although the plants are rather tall (5 feet) for Magnum Bonum Marrowfat, which is said to be 3 to 4½ feet tall only.

Peerless Marrowfat. Refs. 45, 46; Farquhar *Cat.* 1909. Peerless Marrowfat was introduced in 1895 by Sutton. It was very slow in reaching America, and has never been much listed here. Seeds of a Peerless were received at this Station from British Columbia; but the pods produced were apparently too blunt to correspond to descriptions of Peerless Marrowfat, and Peerless Marrowfat was rather early midseason while Peerless required 10 weeks to first pods, even from late sowing. The varieties agreed in other characters.

Peerless Marrowfat is a good, maincrop variety, much shorter in stem than Telephone, 2½ to 3 feet; pods almost as long, of similar shape, generally paired; peas 8 to 10, large, dark green; seeds large, blue green, wrinkled.

Prizewinner (Refs. 47; Burpee *Cat.* 1910) was introduced in 1896 by Sutton and reached the United States in 1910. Almost as dwarf as Gradus and Laxtonian, it is otherwise similar to members of the Telephone group.

Height, 3, 3½, under some conditions, 4½ feet; stem, foliage, and pods dark green; pods paired under good culture, long, broad, straight, peas 8 or 9, large, deep green, finely flavored. Second early and bears heavily. As grown here exceedingly like Boston Unrivalled, 1½ feet shorter, and with slightly darker, better filled pods. Neither gave good crops, but Boston Unrivalled slightly better. Neither seems adapted to our climate.

Hobbies Prizewinner, listed by Hobbies in 1912, appears to be a taller selection of this variety, with very long, plump, curved pods.

Phonograph (Ref. 48) is unknown except as listed as new by Landreth in 1896, and described as like Telephone in general characters but very productive, with very showy, straight, large, distended, sometimes saddle-backed, pods containing 6 to 9 most delicious peas. It is quite distinct from the Phonograph tested at the South Dakota Station in 1903-4.

Enormous (Ref. 49) was offered about 1899 as "No. 4" by Mills, and was given its name as the result of a prize competition. Little detailed description is given, but illustrations of the pods place it in the Telephone group.

As grown here, recently, however, except for a distinct broadening of the pods at the tip, it would be classed with Magnum Bonum,

the pods being much more rounded at the tip than as shown in the catalogs. Except for this slight pod difference Enormous would be called a finer type of improved Telephone, with better colored peas, much more productive, but possibly a little later.

Monarch (Refs. 50, 51) appears to have been introduced, or improved, by Sharpe about 1900, when given an Award of Merit by the Royal Horticultural Society, and was grown in South Dakota in 1904. Of Duke of Albany type, about 4 feet tall, and "one of the best yielding peas in existence."

Sutton Perpetual (Ref. 52), introduced in 1889, is entirely distinct from Walker's Perpetual Bearer, a much older pea of the Ne Plus Ultra group, and does not appear to have come to America.

Pods paired, of Telephone size and shape, but broadening gradually from neck to tip, which is usually slanted dorsally as well as ventrally; handsome in appearance, good green in color, but wrinkle early. Height $2\frac{1}{2}$ to 4 feet, branched at base and above; flowers from 12th to 14th node; it begins maturing a little later than Telephone and bears for a long time, being quite resistant to mildew.

Rough Rider (Ref. 53) was a selected Telephone introduced by Salzer in 1902; and, according to a letter from that firm dated Nov. 20, 1926, was discarded in favor of Alderman. Its height was given as $2\frac{1}{2}$ feet.

Centenary Marrowfat (Refs. 54, 55) was listed in Sutton's 1900 catalog but in some later ones the name was shortened to Centenary. Seed of the variety under this name came to us from British Columbia, but Centenary Marrowfat was the name on the packet of seeds from this source that later produced a pea quite similar in many respects to Eckford Centenary, yet hardly indistinguishable as that variety.

As grown here Sutton's Centenary Marrowfat was of very good Telephone type, branched both at ground and above; pods beginning at 16th node, occasionally paired, 4 to $4\frac{1}{4}$ inches long, broad, oval or flat in cross section, with heavy, wrinkled walls, not plump, fairly well colored; peas 6-7, large, dark green. It was nearly a week later than Telephone and more productive. The variety from the other packet of British Columbia seeds resembled the one just described in vine characters though not as tall and with broader leaflets and much larger stipules; but the pods were more than half an inch shorter, of similar shape but appearing broader because of the diminished length, and contained fewer and smaller peas. It did not give as good crops as Telephone.

Eckford Centenary, listed as new in 1906 by Eckford, was called an excellent maincrop variety, 3 feet tall, and illustrations showed long pods, smoother and more curved than those of Telephone.

Sharpe Standard (Ref. 56) originated with Sharpe before 1900, when it received an Award of Merit from the Royal Horticultural Society. Rarely listed in America. Said to have been of Alderman type, but superior in every way to that variety.

As grown at McMillan, Mich., in U. S. Department of Agriculture tests: Height 4 to $4\frac{1}{2}$ feet; stem very smooth, light colored, almost round below, with few branches; leaflets and stipules very large, medium green, but much whitened and with wide white veins; flowers began at the 14th or 15th node, very large with faint pinkish flush; pods on long rigid stalks, $3\frac{3}{4}$ to 4 inches long, broad, straight with long-rounded ends and usually a dorsal slant, bringing the small tip near the center; peas about 9, large. Ready for picking in midseason and crop good to very good.

Sutton Masterpiece. Refs. 57; S. Dak. Sta. *Bul.* 91:7. 1905; Farquhar *Cat.* 1911. This Masterpiece, originated by Sutton in 1901, was grown in a test at the South Dakota Station in 1904 and listed commercially in the United States in 1911.

It is a robust, maincrop pea, $2\frac{1}{2}$ to $3\frac{1}{2}$ feet tall, with dark green foliage and pods; latter usually paired, long, broad, straight, with long rounded or pointed, tipless ends, rather coarsely wrinkled at picking time; peas 7 or more, large, dark green. In the South Dakota test the peas cooked quickly, were soft, of good color and flavor, and moderately juicy and sweet.

Teddy Roosevelt (Refs. 60, 61, 62), introduced or renamed by Northrup, is Duke of Albany, or a selection from it.

As grown here, only the slightest, unimportant differences could be seen. No evidence was found to support the introducer's claim that it "shells out almost twice as many peas as Telephone" to a bushel of pods. It bloomed and podded somewhat more freely than Telephone, and the pods were darker in color.

Summer Queen (Ref. 63) was listed by Wood, Stubbs & Co. as early as 1901, and was still carried by them in 1926, tho not listed by others.

They give the height, at various times, $2\frac{1}{2}$ and $3\frac{1}{2}$ feet; but in our tests, from the firm's seed, it was 5 feet; more branched than Telephone; foliage scantier, lighter colored, very coarse, with round-tipped, lightly clasping stipules; tendrils slender; flowers rather few, began high on the stem; pods Telephone-like, not broad nor as well filled; peas rather smaller than those of Telephone and less uniform in shape, occasionally quite irregular. Decidedly earlier in season than Telephone, but not a good cropper.

Exhibition (Refs. 64, 65) was sent to the Royal Horticultural Society for testing in 1908 by Carter; and in 1908, Vaughan listed as new Vaughan's Best Exhibition, which by comparison of descriptions seems to be very similar to Carter's pea, if not identical with it. Carter received an Award of Merit for Exhibition in 1910, but such commendation was denied in 1918.

The variety was as late, if not later than Telephone, taller, with darker, 5-inch pods, sometimes paired, of Telephone shape. Vaughan says "unusually productive" and "pods really giants."

Premier. Ref. 68. Among various Premier peas, none was listed in American catalogs when our tests began in 1922, but seed of one variety came to us from the Idaho Station of whose identity we are not quite certain, as it differs in one or more characteristic points from McLean's, Eckford's, or Nellis' Premier. It corresponds, to some extent, to a Premier sent to the Royal Horticultural Society for testing in 1911, by Bell & Bieberstedt, but not enough details are given in the descriptions of that pea to say whether or not the two are identical.

As grown here it was a Telephone pea of very good type, much like Prince Edward. Height $3\frac{1}{2}$ to $4\frac{1}{2}$ feet, considerably branched; foliage delicate dark green; pods large, dark green; peas large, long-oval, of fine color; seeds sown were smaller than any of the Telephone type except Empress of India, perhaps due to their growth in a dry season in Idaho, as the peas and crop seeds were large. It ranked with Telephone in productivity.

Sutton Superlative (Ref. 69) was introduced by Sutton in 1906, and probably not grown commercially in America. The stock we tested came from the trial plats of the Idaho Station.

Quite dwarf and bushy for a Telephone pea, $2\frac{3}{4}$ - $3\frac{1}{2}$ feet tall; branches many, at base and middle of the stem; stem slender, enlarging toward the top; foliage like that of Telephone; pods excellent examples of the type, of medium size, $3\frac{3}{8}$ to $4\frac{3}{8}$ inches long, broad, moderately plump, quite uniform, of good color; peas 7 to 9, fair sized, dark green. It is distinctly later than Telephone and not a heavy bearer.

Petoskey (Ref. 70) was listed in 1908 by Darling and considered distinct from Telephone, Duke of Albany and Alderman, as all four varieties are listed together in some of this firm's catalogs. It seems to have been a selection from one of these:

Productive, but late, with short ($3\frac{1}{2}$ -4 feet), strong, "stocky" stems; abundant, coarse, light green foliage; and "immense," dark, rich-colored pods, filled to the ends.

Harvestman (Ref. 71), an Express x Duke of Albany cross, was introduced by Carter before 1912. It is unknown in this country except thru non-commercial trials. It was grown here in 1926, and seems a fine late Telephone, with large, medium green foliage and pods, and rather lighter colored peas. In England it was held superior to Duke of Albany but here hardly separable from it by description. Actual comparison was not made, since the two peas were not grown in the same season.

Home Garden (Ref. 72) was cataloged in 1909 by Moore, and was dwarf. As grown here in recent years, from seed obtained from the introducers, it was a Telephone-type pea.

Stems 4 to 5 feet long, very stout; branches few, medial; foliage very coarse, dark green but much whitened; pods hardly as large as those of the better peas of the group, but dark green in color, plump, very well filled; peas about 7, very large, compressed and indented, finely colored. It was later than Telephone, but giving a better total crop.

A letter from the Moore Seed Co., Jan. 25, 1927, says the true Home Garden is dwarf, but that other peas vary greatly in height on different soils in the vicinity of Philadelphia, so Home Garden may be taller on heavy soils. Home Garden, as cataloged, would belong in the pointed pod section of Large-podded Dwarf peas.

Golden King (Ref. 73) originated in Germany and was introduced into America in 1909 by Livingston. It reached England at about the same time.

It was characterized by the uniform, shining, deep golden yellow color of the pods, each with a distinct band of green marking the dorsal suture. Otherwise it was of Telephone type, 4 to 4½ feet tall, with vigorous vines, covered with bright green foliage, and bearing, at the same season, a good crop of pods fully as long, broad and plump as those of Telephone. Except as a novelty in the home garden, the yellow of the pods was a defect; and the variety was not long grown.

Top Notcher (Ref. 74) was announced by Schultz in 1910 as "comparatively new" and "one of the best of the Telephone type." It was probably Alderman.

It was 5 feet high, vigorous, with dark green foliage and long, dark green, well-filled pods which retained their color long after shipping.

Up-To-Date (Ref. 75) was another exhibition pea, introduced by Sutton in 1912; and never, so far as known, brought to America in a commercial way.

It has been grown at the Station from seed from the originator and from the University of British Columbia, the two strains showing no characteristic differences.

Pods slightly broader and smoother than those of Telephone, often poorly filled, sometimes decidedly "puffy," of about the same color; peas rather smaller, medium green. Later than Telephone and no better as a bearer.

Gregory's catalog of 1897 has been misread to make Up-to-Date a synonym of Carter's Daisy; but the seedsman's intention was only to characterize Daisy as an "up-to-date" pea.

Bell (Ref. 76) has been grown experimentally at McMillan, Mich., by the U. S. Department of Agriculture, and at this Station, but probably not introduced into America commercially. It was listed in 1912, perhaps earlier, by Dobbie, as a recently introduced, maincrop pea which they could recommend highly.

In our tests, too dwarf for a typical Telephone, 2½ feet tall; leaflets large, quite often in 6s rather than in 4s, they and the stipules being distinctly bluish medium green in color, very glaucous but not whitened; flowers cream tinted, from the 10th node; pods often paired, on long, heavy stalks; slightly shorter and not quite as plump as those of Telephone, otherwise similar and of the same medium green color; peas averaged more than 6, smooth, round oval, quite large, not well colored; seeds mixed cream and green, well wrinkled.

In spite of the pairing of the pods the yield was no better than that of Telephone, and somewhat later.

Clipper (Ref. 77) probably originated with Sydenham about 1913. As there is also an Alaska type Clipper, it is difficult to say which, if any, American listings of the name refer to this pea.

Seed of it received at this Station in 1922 from the Idaho Station gave a short-stemmed pea of the Alderman type; pods decidedly longer, narrower; peas more numerous, smaller, rounder, dark green; seeds sown almost wholly cream colored, but those harvested nearly all good light green, larger and more wrinkled. It was in season with Telephone and gave similar yields. Clipper as grown here in 1926 from seed raised at McMillan, Mich., on the U. S. Department of Agriculture plats was not as tall and produced shorter, broader, pods, but was otherwise very similar to the strain previously grown.

Dark Green Pod (Ref. 78), under which name Haskell listed this pea in 1913, is probably Alderman, or a selection from it, as Alderman is not listed with other peas of the Telephone group offered, including Admiral Dewey, and the description corresponds very closely to that of Alderman in America.

Market Gardener (Ref. 79) resulted from a cross between Early Morn and Duke of Albany, both Telephone-type peas, so is included here; altho its characteristics are not quite those of Telephone, differing mainly in the comparatively shorter, slenderer, and more curved Market Gardener pods. It was listed in England in 1913 by Carter who at that time also maintained an American branch and probably introduced the pea here about the same time. It apparently never gained a foothold with commercial growers.

It was grown at the Station from two lots of seed, one from the introducer and one from the Idaho Station. These were alike, except that the Idaho Strain was four days earlier.

The plants, 3½ to 4½ feet tall; pods from the 13th node; peas as many in pod as Telephone, smaller. American conditions did not favor Market Gardener; for it did not produce as heavily as Telephone in our tests.

Full Crop (Ref. 80), listed by F. W. Bolgiano in 1913, was said to be like Telephone but more prolific and with larger, greener pods. This also may have been Alderman.

Yankee Prince (Ref. 81), introduced by Simon in 1911, is probably Alderman. As grown at this Station, it differed only in very minor points from that variety; and both podded higher up on the stem than most peas of the group.

William Richardson (Ref. 84) was sent by Nutting to the Royal Horticultural Society for testing in 1916 where it was highly commended, and it received a similar award in 1922. It has not, apparently, been in the United States commercially, but seed was received here from the Idaho Station.

A good, short-stemmed pea of Telephone type, more uniform in size of pods tho these were slightly shorter, about 4¼ inches. The curving of the pods noted in English descriptions was not evident tho the tips were long-rounded, giving a somewhat curved appearance. Foliage, pods and peas were of decidedly better color than those of Telephone. It was several days later than Telephone, and no better cropper.

It might probably, be better placed in the pointed pod section of the Large podded Dwarf group.

Good Indeed (Ref. 82) was introduced by Kelway in 1915, and has been tested by the U. S. Department of Agriculture, and at this Station from Idaho Station seed, but has not been listed in the United States by any well-known seedsman.

In our tests it proved a moderately tall-stemmed, branched pea of Telephone type, with quite uniform, medium green pods, 3¾ to 3⅞ inches long, slightly curved, quite well filled with large, round-oval, dark green peas. Season and crop were like those of Telephone.

Late Gradus (Ref. 83) probably originated with Keeney, but was introduced in 1915 by Vaughan. It was said to be a special Gradus bred to fill a particular place and time, coming between the last of Gradus and the first of Telephone.

With us, from Keeney seed, it seemed much like Telephone, slightly shorter, more branched, with larger, round tipped stipules; pods began higher on the stem, occasionally paired, a trifle longer and not as plump, or as well filled; seeds larger, and with more of green in the coat color. Almost as late as Telephone and similar in crop production,—good only.

Lord Kitchener (Ref. 85) was introduced in 1916 by Sutton and said to be of Duchess of York type. It was grown here from British Columbia seed; but is apparently otherwise unknown in America.

Much shorter than Telephone, but hardly dwarf enough to be classed with Laxtonian; pods of Telephone type and fully as large, with fewer peas, and not usually well filled. It is decidedly earlier than Telephone, but crops poorly under our conditions.

Lord Leicester (Refs. 87; *Jung Cat.* 1919) from a cross between Gradus and Stratagem, made by Laxton, was introduced by Harrison (2), before 1917; and listed in America in 1919. It is of Alderman type, tho of quite different parentage.

As grown at this Station: Much more dwarf than in English descriptions, 2¼ to 3 feet; stem stout, much branched; foliage abundant, dark green, of large, square-tipped leaflets and slightly larger, round-tipped stipules, both somewhat whitened; flowers from about the 10th node; pods only moderately long, 3¾ to 4¼ inches, but broad, plump and better filled to the rounded ends than most of the type; peas 6 or 7, very large, of fine dark green color. It was about as early as any of the group and yielded very well, much better than Telephone.

Aristocrat (Refs. 88, 89) was announced as his in 1919 by Jung, and said to be only 1½ to 1½ feet tall; but as grown in our tests it was 3 to 3½ feet tall. This is only such difference in height as might be expected here, from that given in descriptions of an English Aristocrat, which seems otherwise similar to Jung's Aristocrat. This English pea was introduced by Jas. Veitch in 1901.

In our tests it was a rather short-stemmed, unbranched Telephone with long, very broad pods, slightly curved, well filled to the tip but not to the edge and rather light in color. It was late, even for Telephone, but bore much better crops.

Longfellow. Refs. 90; letters from J. T. Moreland, Pres., Geo. Tait & Sons Co., Dec. 14, 1922, and from same company Jan. 26, 1927. Longfellow was listed by Tait in 1918 under a description previously used for Admiral Dewey. However, an early letter from the firm says Longfellow was from a cross between Alderman



Very large stipules and prominent tendrils

GOLDFINDER

(Two-thirds natural size)



GOLDEN VINE



CANADA FIELD



BLUE PRUSSIAN



DWARF WHITE SUGAR



ALASKA



VICTORIA MARROW



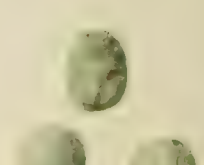
SANGSTER No. 1



LARGE WHITE MARROWFAT



SIMON FILLBASKET



SUPERB



ACQUISITION



SCIMETAR



LIGHTNING



ROYAL SALUTE



PILOT



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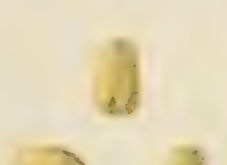
GREEN ADMIRAL



THOMAS LAXTON



VICTORY



HUNDREDFOLD



MAGNUM BONUM



LITTLE GEM



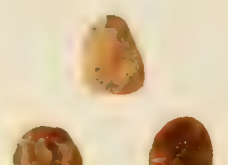
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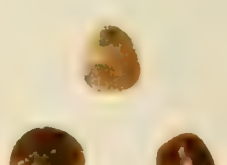
ALDERMAN



LITTLE MARVEL



LUSCIOUS



GIANT SUGAR



MUMMY

and Duke of Albany and a later one that it was a selection from Sharpe Queen. There is very little difference between Longfellow, Duke of Albany, Admiral Dewey, and Alderman, but Longfellow was thought to have a trifle larger pods.

As grown here, the average length of Longfellow pods was second to Duke of Albany, and greater than that of Admiral Dewey and Alderman grown the same seasons. The differences were minute, however, and might easily have been changed in direction by slight soil variations or by using larger or smaller numbers of pods for measurement. In another season and from a different lot of seed, Longfellow was shorter both in vine and in pod.

About all that can be said for the four varieties named is that under similar conditions, they are all somewhat better peas than the original Telephone.

Plentiful. Ref. 72. Seed of a Sutton's Plentiful pea from the University of British Columbia was received at the Station in 1922. Sutton's catalogs from 1896 to date do not list any Plentiful, but Hurst sent a pea so named to the Royal Horticultural Society in 1918. This, however, bore paired, curved pods of Senator type, while the British Columbia pea grown here is plainly of Telephone type, differing only in minor characters from that variety, later and less productive. The pods were of only medium length, very tough and leathery to the touch, not well filled, but of good color.

Amateur Pride (Ref. 92) was introduced by Sutton in 1919, and has been tested at this Station and by the U. S. Department of Agriculture, but probably not yet introduced in the United States.

It is a Telephone-type pea, moderately tall, quite late; pods finely colored, medium sized; peas good dark green. A rather characteristic feature is the very frequent presence of leaves on the long, thick pod-stalks. The pods do not contain as many peas as Telephone nor are these large. It is said to bear paired pods very profusely in England but it was only a fair cropper in our tests.

Prizetaker (Ref. 93) was introduced into America by Moore & Simon as a "fine new English sort." This would seem to separate it from the Prizetaker listed by Sutton & Son in their catalogs of 1896 (our earliest) as "a well known variety" and found very similar to Hundredfold in the Royal Horticultural Society tests of 1901. We have been unable to find any other wrinkled-seeded

Prizetaker in a fairly representative collection of English seedsmen's catalogs.

A Pacific Coast firm say Prizetaker came from England and is Alderman. As we grew it, it was rather short-stemmed, branched, $3\frac{1}{2}$ to 4 feet; pods $4\frac{1}{8}$ to $4\frac{1}{2}$ inches long, narrower and plumper than those of Telephone, rather better colored, with about one less pea to the pod, but these are very large and dark green. Its season is somewhat earlier than that of Telephone, but the crop no better. These data would make Prizetaker a very good strain of Alderman.

Maincrop. Ref. 95. There have been many Maincrops in pea literature but the latest one to appear and among the best tested here is this one, of Telephone type, which was introduced by Clibrans before 1924, and tested by the U. S. Department of Agriculture at McMillan, Mich., and by this Station.

It differs from Telephone in having scanty foliage, with large, broad leaflets in 3s and 4s, "notched" or almost serrated toward the tips and very large, round-tipped stipules; in the distinct greenish shade of the very large flowers and in the noticeable bluish bloom on the pods. These are not quite as long as those of Telephone, but fill better and show a high ratio (1:1.3) of pea weight to shelled-pod weight. The pods are about like those of Telephone in color, but the peas are dull, rather than bright, medium green. Tho tested in different years, the season seems to be that of Telephone and the crop about the same. In England Maincrop often bears paired pods and is very productive. It seemed very resistant to disease, showing no sign of root injury from the leaf-spot fungus that damaged many varieties tested with it.

Imperator (Ref. 96) was listed by Buist in 1921, or earlier. It was grown here from the introducer's seed, and appeared to be a good type of Telephone with broad, dark pods; but from seed from the U. S. Department of Agriculture plats at McMillan, Mich., presumably from the same source originally, a decidedly different pea appeared, the variations extending to plant, foliage, pods and pea, but not excluding the variety from the Telephone group.

Peacemaker (Ref. 97) was listed by Kelway as an improvement of Alderman, which an award from the Royal Horticultural Society helps to confirm. It is mentioned here only to say it is entirely distinct from the Peacemaker listed by Ebbert in 1906, which is of Laxtonian type.

MINOR VARIETIES IN SENATOR GROUP

Dr. Hogg. Refs. 1; Thorburn *Cat.* 1890. Laxton obtained Dr. Hogg, sometime before 1872, from a Prolific Long-pod x Little Gem cross. It was noticed immediately in an American periodical; but apparently was not introduced here until 1890; nor has it ever been widely grown.

The plants were said to be of Sangster No. 1 type, $3\frac{1}{4}$ to $3\frac{3}{4}$ feet tall, not branched, and podding somewhat lower than Senator, which it apparently resembled closely in pods, tho these were lighter in color. It was much earlier than Senator, early midseason, and not a heavy bearer.

Hogg (*Yr. Bk.* 14:101. 1873) says this is a fine, dwarf, early Ne Plus Ultra, but shows curved pods in figure.

Unique (Refs. 2; Portland Seed Co. *Cat.* 1914) seems to have been from the same originator and of the same time of origin and parentage as Dr. Hogg, described above, but was very dwarf in habit and podded very near the ground. The pods were often paired, were broader than those of Dr. Hogg, better green and with larger peas. It was very early and matured very promptly.

We find no record of any pea of the name in America except in the catalog of a western seedsman 40 years after the pea originated. From the description it may be the same variety.

Supplanter (Refs. 2a; N. Y. Sta. *Rpt.* 3:267. 1885) originated about 1872, with Laxton, from a Veitch Perfection x Little Gem cross. The pea tested at this Station in 1884 could not have been this Supplanter, tho received and grown under that name; and it is rather doubtful that the real variety was ever grown in America.

From English descriptions, the pea was considered "a great improvement on Scimitar," with long, broad, slightly curved, pointed or long-rounded pods; very large, pale bluish green peas, turning to much indented or wrinkled seeds. The pods were too broad for true Senator type, but too long pointed to be included with Veitch Perfection, so their curved shape places the variety here. It was very late, subject to mildew because of heavy foliage, and not very productive.

Seedling Market (Ref. 3) was sent to this Station for testing in 1885, by Bennett.

It was a dwarf, midseason, prompt-maturing variety with long, paired pods of Senator type, light in color and with heavy bloom; peas 5 to 7, large, slightly compressed, pale in color.

Charmer (Refs. 5, 6; N. Y. Sta. *Rpt.* 7:136. 1889) originated with Laxton. He sold the stock to Harrison (2), who introduced it in 1886. It was tested at this Station in 1888, from seed sent by Henderson, but he probably did not introduce it commercially as it is not listed in his early catalogs. Apparently the same pea was introduced by Vick, tho Laxton's name is not mentioned. It was considered promising in tests here, but has not been much grown.

Charmer was from $3\frac{1}{2}$ to $4\frac{1}{2}$ feet tall, with more sparse, smaller foliage than Senator, pods of deep green color, often paired, more slender and often with more, smaller and more compressed peas. It was a much earlier pea than Senator and very prolific.

St. Duthus (Refs. 6; Thorburn *Cat.* 1889) was raised by Holmes before 1887, when it received a First Class Certificate from the Royal Horticultural Society. It was offered for the first time in America in 1899, but has been little grown and is unknown here now, tho still obtainable in England.

Usually less than 3 feet tall in America and only $2\frac{1}{4}$ in our tests from seed grown at McMillan, Mich., much darker in foliage than Senator, pods paired, from 14th-15th node; very like those of Senator; peas average 7, medium-sized, of good color, which they hold in cooking, fairly sweet, but rather tough skinned. Ready in late midseason, the one crop was good.

Stanley. Refs. 13; *Gard. Chron.* 3rd ser. 18:423. 1895; Denaiffe *L. P. P.* 52. 1906. Horsford crossed American Wonder and Telephone to secure Stanley, which he introduced in America in 1891 and later sent to England where it was highly recommended, and to France. It never gained a foothold as did his older pea, Market Garden.

Height variously given as $1\frac{1}{2}$ to 3 feet; stem rigid; foliage dense, consisting of very large leaflets and stipules, "fresh" green

washed with grayish; its pods, from 7th node, $3\frac{1}{2}$ to 4 inches long, broad, curved, light green in color, and well filled; peas 5 or more, large, of excellent quality. It was ready about with *Advancer*, rather earlier than *Senator*, matured uniformly, and was only moderately productive.

Sterling (Ref. 14a) was grown at the Michigan and Arkansas Stations in 1894 from seed supplied by the U. S. Department of Agriculture. In Arkansas the vines "made rank growth," but in Michigan were severely affected by drouth so no data are given.

The pods were long, slender, curved, not evenly or well filled; peas of fair size and good flavor; seeds "blue" wrinkled. It was ready 10 days after the earliest variety; "not specially desirable."

Maincrop. Refs. 15, 16. The "Maincrop" peas are innumerable and separation in many cases impossible; but two, grown at this Station, appear to be these:

(1) **Maincrop**, from seed received here in 1888 from the Specialty & Novelty Seed Co., Newton-le-Willows, Lancashire, Eng.:

Taller than *Senator*, 4-5 feet., unbranched, foliage medium green, little whitened; pods numerous, often paired, $2\frac{1}{2}$ to 3 inches long, broad, somewhat curved, slightly paler than foliage, with 4-6 large, flattened or compressed peas; midseason.

(2) **Veitch Maincrop**, recently grown from University of British Columbia seeds:

Shorter than *Senator*, $2\frac{1}{2}$ feet, much earlier, stems and foliage very similar, pods one-fourth inch shorter, broader, well curved, slightly more pointed, similar color, not so well filled, many seeds abortive, peas similar and seeds larger; not as productive.

Glory of Devon. Refs. 17; Vaughan *Cat.* 1908. R. Veitch received an Award of Merit for this pea from the Royal Horticultural Society in 1899 and it is many times noticed in English pea literature, being called in 1925 a "popular West Country maincrop pea." Veitch Perfection is given as one of its parents. It was introduced into America in 1908. As grown here, from British Columbia seed:

Height: $2\frac{1}{2}$ feet, and otherwise similar in plant to *Senator*, with foliage distinctly marbled; pods decidedly shorter, broader, much curved, very poorly filled; peas usually only 3 or 4, very large, broad, oval or oblong, flattened, dark green. Its season was about that of *Senator*, perhaps a little later; but it was not productive. Evidently not adapted to our conditions, as it was carried but a few years by either of its American introducers.

Rearguard. Ref. 22. Dickson (2) claims introduction of *Rearguard*, tho it was sent to the Royal Horticultural Society in 1910 by another seedsman. It received an Award of Merit in 1917. It was grown here from Idaho Station seed and has not been found in American catalogs.

Hardly of *Senator* type, the pods being broader and less curved; but since it is classed in England as an improved Gladstone, it seems best to place it in the group with that variety. Plants quite like those of *Senator*; foliage of about the same shade, modified by heavy, bluish bloom; pods begin higher on the stem, 16th node, frequently paired. Some pods broader and less curved as indicated above, darker than those of *Senator*, not so well filled; peas 7 in better pods, rather darker than *Senator*'s but occasionally showing a yellowish tinge. The variety, as the name indicates, is very late, but paired pods give yield equal to *Senator*.

President (Ref. 23) was tested at the Royal Horticultural Society Gardens in 1911, being sent by Dickson & Robinson, Manchester, Eng., presumably the introducers. A later test in the Royal Horticultural Society Gardens showed *President* "too much like *Union Jack*," but it was later and gave a very good crop. Not found in American catalogs but tested here from seed sent by the Idaho Station.

It is essentially *Senator*, with dark, bluish green foliage and darker pods, tho the peas are apparently of no better color. Other differences were very slight.

Star of Australia (Ref. 24) is of unknown origin, but it was grown here from University of British Columbia seed and seemed an inferior *Glory of Devon*, with rather larger pods, lighter colored and poorly filled. The peas were large and of good quality; but the crop was very poor.

James Kelway (Ref. 25) originated with Kelway in 1912, and is a dwarf *Senator* with broader, less curved, dark green pods. As grown here from Idaho Station seeds:

Height $1\frac{3}{4}$ to 2 feet; stems stout, erect, greenish white, needing no support, somewhat branched; foliage abundant, dark green; pods large, uniform, well filled; peas 6 or 7, medium to large, oblong,

indented, dark green, of very good but not the best quality. Under our conditions the pods were borne singly; but even so gave good crops. In England the pods are usually in pairs and probably would be elsewhere under better pea-growing conditions, since the variety set its greenish white flowers very freely and often in pairs. The season was a few days later than that of *Senator*, and the pods matured promptly.

Union Jack. (Refs. 26; Morse *Cat.* 1922. *Union Jack* probably originated with Hurst before 1918, when sent the Royal Horticultural Society for testing. It was brought to America in 1922, and seed of it came to us from Idaho and from British Columbia in that year.

Aside from a little more vigor, greater height of vine and size of pod from the British Columbia seeds, which were more wrinkled, the strains were identical, and both very much like *President*, tho later and with less curved and broader pods, those from the British Columbia seed being better filled. *Union Jack*, like *President*, may be described as a late, dark-podded *Senator*. As noted under *President*, a later test made *Union Jack* the earlier of the two varieties.

Giant Exhibition (Ref. 27) was listed by Salzer in 1918 as the "largest pea grown;" but in our tests it has not given as large pods as several varieties of the Telephone type. It is excluded from that group by the curve of the pods, most noticeable near the tip.

Plants more like those of Telephone than of *Senator*, $3\frac{1}{2}$ feet tall; stems stout with occasional medial branches, foliage light green but abundant, with large, whitened, sharp-tipped stipules having shallow teeth up to the middle; flowers from 10th node up, single, on long, rather heavy stalks; pods light green, $3\frac{3}{8}$ to $4\frac{1}{2}$ inches long, broad, narrow oval in section, only moderately plump, usually but not always filled to the tip and seldom to the edge; peas dark green, larger than those of *Senator* but much smaller than those of Telephone. It is the latest pea in the *Senator* group and a poor cropper.

Advance Guard (Ref. 28) originated with Unwin, and was introduced as a novelty in 1921. So far as known, it has been grown in the United States only in tests — by the U. S. Department of Agriculture and this Station.

Dwarf, $1\frac{1}{2}$ to $1\frac{3}{4}$ feet tall (twice as tall in England), with a few basal branches; foliage abundant, rather dark, bluish, very coarse, only slightly whitened; flowers medium sized, very green at the base, from 11th to 13th node, paired; pods rarely paired, of typical *Senator* type, but less curved, $3\frac{1}{2}$ to $3\frac{3}{8}$ inches long, uniform, rather narrow but plump, well filled both to edge and rounded to long-rounded, tipless end; peas 7 to 9, large, square to almost cylindrical, medium green, of very good quality; seeds of medium size, broad oval, or oblong, flattened, very well wrinkled and almost uniformly light bluish green in color, with only an occasional seed showing a tint of cream. It gave in midseason very good crop, for a variety recently brought across the Atlantic. In England it develops "rabbit ear" rogues.

Freedom (Ref. 29), from Hurst, was given an Award of Merit by the Royal Horticultural Society in 1922. So far as known, it has been grown in America only at this Station; but seems worthy of inclusion because of its productivity, which too many English varieties lack when first imported.

Freedom is an improved and earlier Gladstone, 2- $2\frac{1}{4}$ feet tall, stout-stemmed, erect, occasionally with branches near the top of the stems and with abundant, dark foliage, whitened on both leaflets and stipules; pods single, from 12th to 14th node, practically indistinguishable from those of Gladstone, well filled and produced more freely, making this one of the best of the broad-podded, *Senator*-type peas.

Phenomenon (Ref. 30) originated with Sutton in 1922, and, like *Freedom*, is known in America only by growth in test plats, at Wisconsin Station and at this Station.

Very dwarf, $1\frac{1}{2}$ feet here, but slender-stemmed (said to be "stout" in England), and drooping, branched both at the ground and above; foliage abundant, medium green or dark yellowish green, like that of *Senator*; pods from 12th node, often paired, very large, sometimes reaching 5 inches (which, surprisingly, is as long as reported for England), broad, moderately plump, slightly but distinctly curved, dark green, not always well filled; peas in good pods 6 to 9, large, oblong, flattened, sometimes almost triangular, smooth surfaced, dark green. The pods are ready a few days after those of *Senator*, are very smooth just before picking time, but soon wrinkle coarsely. They are much like those of *Jas. Kelway*, but broader. The above descriptions indicate a very good variety; but unfortunately it seems not adapted to our conditions and gave only poor to fair crops.

John Bull (Ref. 31) was sent by Carter to the Royal Horticultural Society for testing in 1922 and found "very similar to Senator," but later. It is not the John Bull of Laxton, described in the Stratagem group.

Chieftain (Ref. 32) was first listed by De Georgi Bros. in 1894, and is apparently their own.

Seeds of Chieftain are considerably larger than those of Senator, hardly well wrinkled, mixed cream and light green; plants like those of Senator, but more dwarf, $1\frac{3}{4}$ to $2\frac{1}{4}$ feet, noticeably glaucous on both stem and foliage; pods begin at 15th node, single, on short, thick stalks, vary in length, $3\frac{5}{8}$ to $4\frac{3}{4}$ inches, considerably broader but plump, as much curved and as well filled as Senator's; peas often 9, medium sized, irregular, sometimes almost disk-shaped, light green to medium green. Season is about that of Senator, yield good to very good. Tho not tested, the peas are probably inferior to the best wrinkled peas in quality.

Canners' Champion was received from the Gallatin Valley Seed Co., Bozeman, Mont., and grown here in 1926 only. It is a canning pea, of Senator type.

Foliage much more glaucous, medium green, leaflets noticeably serrate; pods single or occasionally paired, somewhat broader, less curved, very short rounded or blunt at the ends; peas 5 to 9 (average 7), medium to large, oval, indented, poorly colored, of good table quality. It is a late midseason variety and our one crop of it was not better than "good."

Charlton Victory is an exhibition type pea, introduced recently (year unknown), by Charlton, and grown at McMillan, Mich., by the U. S. Department of Agriculture and at this Station.

It is stouter-stemmed than Senator, flowers greenish white beginning at about the 12th node, often paired, as are the very long ($4\frac{1}{8}$ to $4\frac{3}{4}$ inches), Senator-like pods, with 7 very large, dark green peas of very high quality. It ripened with Senator and gave a very good, crop over a rather long season.

UNDESCRIBED VARIETIES

Names of many peas have been found in American catalogs, periodicals, and Station reports or bulletins, without sufficient data to classify the varieties. These names are given below, but lack of space makes it advisable to omit both references and scanty data given. Such information as we have will be filed for future reference and will be gladly supplied to any one interested.

Poorly described varieties of peas. American Racer, Bennett Green Prolific, Branching Prolific, Carsten Prolific Dwarf, Crosby Hybrid, Dainty, Dew Drop, Early Cluster, Early Queen, Early Woodside, Erfurt Early Dwarf Green Marrow, Erfurt Earliest May, Free Trade, Glory of England, Geo. Clelland, Keen Early Seedling, King of the Market, Liliputian, Magdeburg Gold, Mammoth Beauty, Neapolitan, New York Mammoth Sweet Marrow, Perpetual Early Prize, Plymouth Rock, Pole, Pride of Georgia, Prize Early, Puget Sound, Puritan, Ratekin New Wonder, Read Favorite, Remarkable, Royal Bengal Mammoth Prolific Wonder, Second Early, Second Early Market Garden, Shilling Queen, Standard Early, Standard Late, Standard Midseason, Strasburg, Strategy, Trant Evergreen, Vermont, Vick Nos. 1, 2, 3, Vilmorin Blue Wrinkled, Vilmorin Marrow, Warriston Wonder, White Brunswick, White Rose, Wife's Pin Money, Woodruff Wonder.

The following varieties, not otherwise known to us, were listed, without description or mention of source where previously noted, in Bailey's Annals of Horticulture for 1889, pages 123 to 125: Allen Superb, Blue Gem, Blue Mohawk, Early French, Early Magog, Golden Gem, Huntington Mammoth, New Dominion (may be Dominion, a field pea) and Wonder Gem.

In Bulletin No. 21 (pages 272-293) of the Bureau of Plant Industry of the United States Department of Agriculture, issued in 1903, are recorded the varieties (or names) of peas listed in the catalogs of American seedsmen for 1901 and 1902. Of the following

garden peas there given, we have been unable to obtain further history or description: Abbott of Bardney, Abbott of Reading, Allan Number One, Canners' Favorite, Carter Elephant, Cleveland Market, Early Norther, Early of Earlies, Early Wrinkle, Encore, Extra Early Deposit (probably Despot), Fame, Hawkins Market Garden (probably Horsford Market Garden), Hero, Inexhaustible, Island Prolific, Keith First on Market, Lilly-Bogardus Thoroughbred, Little Giant, Market Gardeners' Favorite, Niles, Northern Leader, Northern Queen, Pride of Denver, Pride of the Garden, Second Crop, Southern Queen, Tuxedo, White Champion, and Wisbeck Wonder.

Many peas unknown to the authors have been grown on the United States Department of Agriculture plats at McMillan, Mich., of which some varieties, selected from a complete list of all grown there in 1925, may soon become of interest to American growers. This list was furnished by Dr. D. N. Shoemaker of the Bureau of Plant Industry of the United States Department of Agriculture. The varieties here noted are mainly recent introductions of English and other European seedsmen or for other reasons are likely soon to be brought to America for further testing or commercial growing: Bedford Star and Bedford Wonder, Boquet, The Breck, Chancelot, Cheltonian, Clibran Abundant, Clibran Hale Perfection, Dwarf Blue Caper, Early Bank Balance, Finchley Wonder, Forerunner, Green Feast, Kinver Gem, Prelude, Primavera, and Saxa. About 50 additional varieties, similar to those just given in history and possible future prospects, were included in the Department tests at Arlington Farms in 1928. Hundreds of other varieties, mainly from foreign sources, are mentioned in Dr. Shoemaker's lists, but these have been secured and grown mainly for historical, systematic or comparison purposes, rather than with any idea that the varieties would be added to our already too extensive list of peas.

REFERENCES, NAMES AND SYNONYMS

EARLY EXTRA GROUP

1. Parkinson *Par. Ter.* 552. 1629. French, or Fulham. 2. Fuller, Stacy, Blackwell *Cat.* 1688 (Rptd. *Gard. Chron.* 3rd ser. 24:107. 1898). Barns Hotspur, Long Hotspur, Short Hotspur. 3. Citizen of Virginia (John Randolph) *Treat. Gard.* 40. (about 1765, rptd. 1924). Ormond. 4. Mawe-Abercrombie *Univ. Gard. Bot.: Pisum.* 1778. Early Golden Hotspur, Early Charlton Hotspur, Nicholas Earliest Hotspur. 5. Thompson *Gard. Asst.* 320. 1859. Golden Charlton, Hotspur, Early Nicholas Hotspur, Nimble Taylor, Paddington, Essex, Reading (see 7), Russell's Early Blossomed, White Boiling, Early Sugar Frame, Michaux, Michaux ordinaire, De Rouelle, Dominé, Petit Pois de Paris. 6. Burr *Fld. Gard. Veg.* 535. 1863 (citing Lawson *Agr. Man.* 1836). Golden Hotspur, Reading Hotspur, Superfine Early. 7. *Jour. Hort.* 48:379. 1872. Hots, Flanders Hotspur, Brampton Hotspur, Essex Hotspur, Omerod's Hotspur, Early Nichols' Hotspur, Charlton Hotspur, Early Charlton, Hastings, Marquis of Hastings, Essex Readings (see 5). 8. *Rural N. Y.* 32:107. 1874. Virginia Hotspur (now called Early Tone (Frame?)). 9. *Hort. Reg.* 3:210. 1834. Late Dwarf, Early Single Frame, Earliest Double Blossomed, Charlton, Common White Boiling, Very Fine Late Garden, Brussels Early Blossomed, Twesley Dwarf, Michaux à la rouelle, Michaux precoce. 10. *Gard. Chron.* 271. 1848. Fairbeard's Early Surprise. 11. *Ibid.* 52. 1850. Wrench's Early Hotspur, Common Hotspur, Eastern Shore. 12. Sinclair & Moore *Cat.* 1826. Early Double Blossomed Frame. 13. *Hort. Reg.* 3:209. 1834. Best Early, Earliest Frame, True Early Frame, Early Dwarf Frame, Earliest Dwarf Frame, Very Early Frame, Early May, Young's Early Frame, Early Nicholas, Early Dwarf, Dwarf Frame, Perkins's (Perkin's in 19), Early Frame, Early Pana, Early French, Early Scone, Bates' (Batt's in 19) Early Dwarf Nimble, Baran (Baron in 16 and 19), Laurant (Laurent in 16 and 19), Early Single Frame, Early One-eyed, Single Frame, Double Blossomed Frame, Double Dwarf Frame, Mason's Double Blossomed, Superfine Double Early, Russell's (Russell's in 16), Fine Early, Michaux de Hollande, Dwarf Albany, Vert à rames de Mont Julien (Julienne in 16), Early Wilson, Plus hâtif. 14. Rogers *Veg. Cult.* 225. 1839. Early Single-blossomed Frame. 15. *Ibid.* 226. 1839. Early Racehorse. 16. *Gard. Chron.* 52. 1850. Early Warwick. 17. *Ibid.* 661. 1852. Florentiner Pfluckerbse. 18. McIntosh *Bk. Gard.* 2:57. 1855. Essex Champion. 19. Thompson *Gard. Asst.* 319. 1859. Single Blossomed Frame, Young's Very Early, De Paris. 20. *Gard. Chron.* 620. 1865. Early Waterloo, Prince Albert, Early Kent. 21. *Ibid.* 172. 1866. Minier's Early Frame or Sangster's No. 1. 22. *Ibid.* 711. 1867. Early Nimble, Early Emperor, Daniel O'Rourke. 23. Landreth *Cat.* 1892. Early Washington. 24. Denaiiffe *L.P.P.* 115. 1906. De Sainte-Catherine. 25. Vilmorin-Andrieux *Pl. Pot.* 429. 1883. (Same as 22, second.) 26. Landreth *Cat.* 1824. Landreth's Extra Early. 27. *Country Gent.* 14:266. 1859. Early Burlington. 28. Russell *Cat.* 1827. (Same as 23), True May. 29. *Amer. Gard. Mag.* 2:428. 1836. Tall Frame. 30. *Gard. Chron.* 550. 1848. Early Grey Warwick. 31. *Cot. Gard.* 25:260. 1861. (Same as 15), Racehorse (Same as 18). 32. *Mag. Hort.* 10:97. 1844. (Same as 15.) 33. Burr *Fld. Gard. Veg.* 535. 1863. Cedo Nulli. 34. *Gard. Chron.* 711. 1867. Washington. 35. Steckler *Cat.* 1913. Early May (possibly incorrect). 36. *Gard. Chron.* 3rd ser. 12:27. 1892. Warner's Early Conqueror. 37. *Mag. Hort.* 15:156. 1849. (Same as 22, second.) 38. Thompson *Gard. Asst.* 330. 1863. Early Bedalean, Early Railway, Stevenson's Railway. 39. *Cot. Gard.* 25:232. 1861. Early Sebastopol, Morning Star, Rising Sun. 40. *Gard. Chron.* 220. 1865. Conqueror. 41. Denaiiffe *L.P.P.* 112. 1906. À la reine, Prodiges, Bergère, Prime. 42. *Cot. Gard.* 25:232. 1861. Girling's Danecroft. 43. *Jour. Hort.* 48:379. 1872. Warner's Danecroft Rival, Girling's Pea, Glass Pea. 44. McIntosh *Book Gard.* 2:57. 1855. Danecroft Early Green, Farnes' Conservative Green Marrow, Transparent. 45. *Gard. Chron.* 753. 1850; and 582. 1856. Rendle's First Early, Rendle's First Early Green. 46. Breck *Cat.* 1838. Cedo Nullis. 47. *Mag. Hort.* 10:91, 93. 1844. Sinclair's Early. 48. White, Jeff. *Cat.* 1846. Early Cedo Nulli. 49. Strong, B. H. & Co. *Cat.* 1838. English Cedo Nulli. 50. *Gard. Chron.* 713. 1841; 630. 1843; 713. 1844. Farnes' Superior First Early. 51. *Ibid.* 665. 1842. (Same as 20, second.) 52. *Ibid.* 476. 1844. Clutton's Early. 53. Warner's *Gard. & Nurs. Cat.* 1845. Early Prince Albert. 54. Dunlap & Thompson *Cat.* 1847. Cormack's (McCormick's, incorrectly, in 13) Prince Albert. 55. Denaiiffe *L.P.P.* 105. 1906. Chaud, Brésilien, Hâtif de Plainpalais (ias in 57), Extra Early. 56. *Gard. Chron.* 1. 1843. (Same as 20, last.) 57. McIntosh *Book Gard.* 2:55. 1855. Kent's Early. 58. N. Y. Sta. *Rpt.* 3:250. 1885. Extra Early Kent, Dilliston's (ne's in 106) Early, De Regneville, Hâtif uniflore de Gendbrugge. 59. Douglas *Cat.* 1843. Early Nimble Dick. 60. *Mag. Hort.* 10:91, 93. 1844. Hill's Extra Early. 61. Hovey *Cat.* 1859. Early Hill. 62. *Gard. Chron.* 2. 1846. Farnes' Earliest May. 63. Denaiiffe *L.P.P.* 117. 1906. Tres hâtif de Mai. 64. Vilmorin-Robinson *Veg. Gard.* 496. 1920. Very Early May. 65. Sinclair *Cat.* 1839. Cromwell's May. 66. *Gard. Chron.* 17. 1847. Bedalean. 67. McIntosh *Book Gard.* 2:57. 1855. (Same as 38, first.) 68. *Gard. Chron.* 721. 1849. Sutton's Early Champion. 69. *Ibid.* 549. 1856. Warner's Conqueror. 70. *Ibid.* 1237. 1866; 660. 1868. Sutton's Improved Early Champion (Same as 22, last). 71. *Ibid.* 33. 1853. Fairhead's Early Champion. 72. *Ibid.* 834. 1854. Fairhead's Early Conqueror. 73. *Ibid.* 753. 1850. Isherwood's Railway. 74. McIntosh *Book Gard.* 2:57. 1855. (Same as 38, second and last.) 75. *Jour. Hort.* 33:467. 1865. Dillistone's Early Prolific, Sutton's Ringleader, Carter's First Crop, Fairbeard's (incorrectly for Fairhead's) Conqueror, Fairbeard's (Fairhead's in 76) Railway. 76. *Gard. Chron.* 580. 1865. Fairhead's Railway. 77. *Ibid.* 704. 1851. (Same as 21, last.) 78. *Ibid.* 532. 1855. (Same as 22, last, questionably placed.) 79. *Ibid.* 1016. 1859. (Same as 22, last, unquestioned.) 80. Dunnett's First Early, Carter's Earliest, Veitch's First Early. 81. *Jour. Hort.* 48. 467. 1865. Dickson's First and Best Early, Carpenter's Express, Fairbeard's Hardy Early. 82. *Gard. Chron.* 220, 580, 1065. 1865. Sebastopol, Sutton's Champion, Fairbeard's "Hardys" Early, Hooper's New Rival. 83. *Jour. Hort.* 48:378. 1865. (Same as 81, second), Dickson's First and Best, Dickson's Climax, Early Caractacus, Taber's Perfection, Hooper's Early Rival. 84. *Gard. Chron.* 3rd ser. 2:618. 1887. Henderson's First of All, Cleveland's First and Best, Rural New Yorker, Carter's Lightning, Hurst's Improved, Sangster No. 1, Sharpe's First Early, (Veitch's) Selected Extra Early; also Alaska and Harrison's Eclipse (erroneously, as both are green-seeded). 85. *Ibid.* 3rd ser. 24:99. 1898. Dandy. 86. Vilmorin-Robinson *Veg. Gard.* 495. 1920. Improved Early Champion. 87. *Mag. Hort.* 18:332. 1852; and 19:9. 1853. Hovey's Extra Early. 88. *Gard. Chron.* 50. 1852. Taylor's New Early Prolific. 89. *Ibid.* 487. 1857. Taylor's Prolific. 90. Burr *Field Gard. Veg.* 549. 1863. Taylor's Early. 91. *Gard. Chron.* 673. 1853. Waite's Daniel O'Rourke. 92. *Country Gent.* 14:266. 1859. (Same as 26.) 93. Thompson *Gard. Asst.* 320. 1859. Sangster's New. 94. Burr *Fld. Gard. Veg.* 533. 1863. Waite's Dan O'Rourke, Early Dan O'Rourke. 95. *Gard. Chron.* 771. 1867. (Same as 77.) 96. Gregory *Cat.* 1885. Extra Early Daniel O'Rourke. 97. N. Y. Sta. *Rpt.* 3:249. 1885. Dan O'Rourke, Sebastopol, (79, last three, 81, second), Daniel. 98. *Rural N. Y.* 48:140. 1889. Improved Daniel O'Rourke, First of All, Earliest of All (probably incorrect), Extra Early, "and many other varieties." 99. Denaiiffe *L.P.P.* 109. 1906. De Hollande jaune, Daniel First and Best. 100. *Gard. Chron.* 816. 1855. Cottrell's Sebastopol. 101. *Ibid.* 487. 1857. (Same as 81, first.) 102. Hovey *Cat.* 1859. Early Sebastopol. 103. *Country Gent.* 10:41. 1857. Far-famed Sir Moot. 104. *Gard. Chron.* 856. 1858. (Same as 79, second.) 105. *Ibid.* 1017, 1035. 1859. (Same as 20, second and last), Dillstone's First Early. 106. *Cot. Gard.* 25:231. 1861. Dillistone's (Dilliston's incorrectly in 58, second) Early. 107. *Gard. Chron.* 220, 1865. Ringleader (82, second). 108. *Ibid.* 194. 1866. Single Blossomed Early Frame. 109. Hovey *Cat.* 1869. Early Dillistone. 109a. Hogg *Gard. Yr. Bk.* 14:71. 1873. Clarke's Rapid Prolific. 110. Weston *Amer. Home Gard.* 163. 1860. Petersburg. 111. *Gard. Chron.* 2. 1846. Prince of Wales (smooth-seeded). 112. Thorburn *Cat.* 1861. Princess. 113. U. S. Com. Agr. *Rpt.* 98. 1865. Princess of Wales. 114. *Country Gent.* 19:79. 1862. Early Princess. 115. *Amer. Agr.* 20:245. 1861. Extra Early Princess. 116. *Gard. Chron.* 580. 1865. (Same as 81, last.) 117. *Jour. Hort.* 33:467. 1865. (Same as 80, last.) 118. *Gard. Chron.* 1071. 1863. (Same as 80, second.) 119. *Gard. Chron.* 1054. 1864. (Same as 75, second.) 120. *Ibid.* 1048. 1865. First Crop. 121. *Jour. Hort.* 33:467. 1865. (Same as 75.) 122. N. Y. Sta. *Rpt.* 3:249. 1885. Dixon's (Dickson's, correctly, in 82, second) First and Best. 123. U. S. Com. Agr. *Rpt.* 29. 1865. First and Best Early. 124. *Gard. Chron.* 121. 1865. Caractacus. 125. Evans *Cat.* 1868. Waite's Caractacus. 126. N. Y. Sta. *Rpts.* 1:197. 1883; 3:250. 1885. (Same as 21, last, 34, 82, second, 85). Taber's Perfection (Taber's, correctly, in 82, fifth). 127. Landreth *Cat.* 1892. Extra Early Prince Albert. 128. Denaiiffe *L.P.P.* 109. 1906. Pierre, Prince Albert ordinaire, d'Avent (in Picardie). 129. U. S. Com. Agr. *Rpt.* 29. 1865. Wheeler's

¹ Should be Tewsley Dwarf, and properly a synonym of White Prussian. *Gard. Chron.* 199. 1850.

Extra Early. 130. L. c. Deacon's Double Extra Early. 131. L. c. Philadelphia Extra Early. 131a. *Ferry Cat.* 1875. Burlington, or Philadelphia Early. 132. N. Y. Sta. *Rpt.* 3:248. 1885. Philadelphia, Extra Early Philadelphia, Cleveland's Rural New Yorker, Dexter, Thorburn's Extra Early Market, Ferry's and Sibley's and Thorburn's First and Best, Hancock, (Same as 26), (Same as 83, first and second). 133. Johnson & Stokes *Cat.* 1892. (Same as 20, last, and 75, third.) 134. Bolgiano, J. *Cat.* 1906. First and Best. 135. Thorburn *Cat.* 1908. First of All. 136. *Jour. Hort.* 48:378. 1865. (Same as 82, fifth.) 137. *Gard. Chron.* 1141, 1189. 1866. Taber's Early Perfection. 138. *Ibid.* 711. 1867. Early Perfection (Brown). 139. *Ibid.* 1055. 1865. Earliest and Best. 140. *Ibid.* 1218. 1866. Poynter's Earliest and Best. 141. *Ibid.* 630. 1868. Poynter's First and Best. 142. Ferre, Batchelder & Co. *Cat.* 1869. Electric. 143. Hawley *Cat.* 1868. East Hartford. 144. *Rural N. Y.* 48:144. 1889. Early Hartford. 145. Griswold, T. *Cat.* 1914. East Hartford Extra Early. 146. Cadwell & Jones *Cat.* 1914. Hawley's Improved East Hartford Extra Early. 147. *Gard. Chron.* 1360, 1493, 1527, 1658. 1872; and 1762. 1873. Emerald Gem, Sutton's No. 1 Green, Sutton's First of All. 147a. Hogg *Gard. Yr. Bk.* 14:73. 1873. Sutton's Earliest of All. 148. Denaiffe *L.P.P.* 108. 1906. Emeraude, Joseph, (as 43, first, incorrectly). 149. *Country Gent.* 30:134. 1871. Buist's Extra Early. 150. Gregory *Cat.* 1872. Extra Early Winship. 151. *Ibid.* 1873. (As synonym in 132, fourth.) 152. Farquhar *Cat.* 1892. Early Dexter. 153. Elliott, Wm., *Cat.* 1899. Improved Early Dexter. 154. Allan *Cat.* 1914. Allan's Early Dexter. 155. Gregory *Cat.* 1878. Hancock. 156. *Mass. Hort. Soc. Trans.* 170. 1882. Hancock's Early. 157. *Ferry Cat.* 1882. (As synonym in 132, sixth.) 158. (As 156.) Laxton's Earliest of All (erroneous, as this is a green-seeded pea). 159. *Ann. Hort.* 124. 1889. Iowa Challenge, Iowa's Challenge. 160. Vaughan *Cat.* 1883. Boston Extra Early. 161. *Rural N. Y.* 43:553. 1883. Carter's New. 162. *Ibid.* 288, 554. 1883. Henderson's First of All. 163. *Gard. Chron.* n. ser. 22:308, 374, 407. 1884. Veitch's Selected Extra Early. 164. N. Y. Sta. *Rpt.* 3:264. 1885. Ferry's Extra Early. 165. *Rural N. Y.* 42:554. 1883. (Same as 83, third.) 166. *Amer. Gard.* 12:688. 1891. (Same as 132, third.) 167. *Rural N. Y.* 43:414. 1884. Reedland. 168. *Gard. Mo.* 25:48. 1883. Breck's Excelsior. 169. N. Y. Sta. *Rpt.* 4:186, 187. 1886. Vick's Extra Early. 170. Everett *Cat.* 1885. Extra Early Reliance. 171. N. Y. Sta. *Rpt.* 4:187. 1886. Everitt's Extra Early Reliance. 172. *Kans. Sta. Rpt.* 2:152, 158. 1889. Everitt's Extra Early Alliance (by error). 173. Gregory *Cat.* 1885. Maud S. 174. Mich. Sta. *Bul.* 57:41. 1885. Extra Early Maud S. 175. Ford *Cat.* 1884. Perfection. 176. Mich. Sta. *Bul.* 131:31. 1896. Morning Star. 177. Allan *Cat.* 1914. Allan's Maud S. 178. Daniels *Cat.* 1892. Gem of the Season, Daniels'. 179. *Rural N. Y.* 44:463. 1885. Smith's Extra Early. 180. N. Y. Sta. *Rpt.* 5:248. 1887. Burpee's Extra Early. 181. *Gard. Chron.* n. ser. 26:824. 1886. Lightning. 182. Roy. *Hort. Soc. Trans.* 34:289. 1908. Giant Lightning. 183. N. Y. Sta. *Rpt.* 6:331. 1888. Carter's Lightning. 184. Denaiffe *L.P.P.* 107. 1906. Eclair. 185. Moore & Simon *Cat.* 1907. M. & S. Lightning Extra Early. 186. Gregory *Cat.* 1906. Pedigree Extra Early. 187. N. Y. Sta. *Rpt.* 5:248. 1887. First in Market. 188. Ford *Cat.* 1894. Livingston's First in Market. 189. *Ann. Hort.* 184. 1892. Snowflake. 190. Mich. Sta. *Bul.* 57:41. 1890. Best Extra Early. 191. Burpee *Cat.* 1893. Burpee's Best Extra Early. 192. Denaiffe *L.P.P.* 104. 1906. Triple X Extra Early. 193. N. Y. Sta. *Rpt.*

7:135. 1889. Hampden Earliest. 194. Colo. Sta. *Rpt.* 189. 1889. Lee's Earliest. 195. N. Y. Sta. *Rpt.* 8:318. 1890. Summit. 196. Northrup *Cat.* 1899. Northrup's Summit. 197. Denaiffe, L.P.P. 105. 1906. Extra Early Summit. 198. N. Y. Sta. *Rpt.* 8:318. 1890. Bergen Fleetwing. 199. U. S. D. A., B. P. I. *Bul.* 21:282. 1903. Grenell's Extra Early Bergen Fleetwing. 200. *Ann. Hort.* 123. 1889. Buist's Premier Extra Early. 201. Undated notes by C. E. Hunn, about 1889. Buist's Early Morning. 202. *Ann. Hort.* 124. 1889. Buist's Early Morning Star. 203. Landreth *Cat.* 1892. (Same as 176.) 204. Buist *Cat.* 1922. Buist's Extra Early Morning Star. 205. *Ann. Hort.* 124. 1889. Orange County Morning Star. 206. N. Y. Sta. *Rpt.* 5:248. 1887. Eureka Extra Early. 207. *Ann. Hort.* 123. 1889. Dreer's Eureka Extra Early. 208. Mich. Sta. *Bul.* 109:57. 1894. Extra Early Challenge. 209. *Ann. Hort.* 123. 1889. Currie's Extra Early Challenge. 210. *Ann. Hort.* 124. 1889. Thorburn's Extra Early Market. 211. *Rural N. Y.* 55:435. 1896. Extra Early Market. 212. *Ann. Hort.* 112, 124, 125. 1889. Extra Early: Ely's, Faust's, Johnson & Stokes, Maule's, Plant's, Wilson's Improved. 213. Field *Cat.* 1907. Improved Extra Early. 214. *Ann. Hort.* 123. 1889. (Same as 134.) 215. Harris *Cat.* 1894. (Same as 98, third.) 216. Condon *Cat.* 1913. Selected First and Best. 217. Alexander *Cat.* 1911. (Same as 131, 135, 187.) 218. Ford *Cats.* 1912, 1918. (Same as 173), Prolific Early Market. 219. *Ann. Hort.* 124. 1889. Leonard's First and Best of All. 220. Vilmorin-Robinson *Veg. Gard.* 494. 1920. (Same as 20, second.) 221. *Ann. Hort.* 124. 1889. Perry's Forty-two Days. 222. N. Y. Mkt. Gardnrs. Assn. *Cat.* 1892. Wood's Lightning Excelsior. 223. Wood *Cat.* 1895. Lightning Excelsior. 224. N. Y. Sta. *Rpt.* 9:293. 1891. Electric (not same as 142). 225. Mich. Sta. *Bul.* 90:15. 1893. Budlong. 226. *Ann. Hort.* 194. 1892. Nebraska Lightning. 227. Ky. Sta. *Rpt.* 5:26. 1894. Family Garden. 228. Johnson & Stokes *Cat.* 1893. Extra Early Market Garden. 229. Hastings *Cats.* 1907. 1924. John L. 230. Gregory *Cat.* 1894. Sunol. 231. Dreer *Cat.* 1894. Dreer's Extra Early Pioneer. 232. Buckbee *Cat.* 1894. Lightning Express. 233. Va. Sta. *Bul.* 60:5. 1896. Despot. 234. Landreth *Cat.* 1896. Canada Extra Early. 235. L. c. Evergreen Pod. 236. Weeber & Don *Cat.* 1898. New York Market. 236a. Elliott, Wm. *Cat.* 1899. Earliest Market. 237. Johnson & Stokes *Cat.* 1898. Record Extra Early. 238. Michell *Cat.* 1899. Dandy Extra Early. 239. *Gard. Chron.* 3rd ser. 30:6. 1901. McLean's Best of All. 240. U. S. D. A., B. P. I. *Bul.* 21:282. 1903. Grey's Perfection. 241. Maule *Cat.* 1901. Prolific Early Market. 242. *Ibid.* 1905. Prolific Extra Early. 243. Farquhar *Cat.* 1904. Farquhar's Prolific Early. 244. U. S. D. A., B. P. I. *Bul.* 21:289. 1903. Rice's Extra Early. 245. Sonderegger *Cat.* 1892. Monster-podded Extra Early. 246. Griffith & Turner *Cat.* 1902. First Early. 247. Michell *Cat.* 1902. Michell's Special Extra Early. 248. S. Dak. Sta. *Bul.* 85:4. 1904. Keeney's Extra Early. 249. U. S. D. A., B. P. I. *Bul.* 21:287. 1903. Northwest Premier. 250. *Ibid.* 292. 1903. Triumph. 251. Bolgiano, J. *Cat.* 1906. Extra Early Triumph. 252. L. c. Good Luck. 253. Farmer *Cat.* 1914. Pedigree First and Best. 254. Isbell *Cat.* 1906. Monarch of Earlies. 255. Tinsley *Cat.* 1911. Early Dixie. 256. Isbell *Cat.* 1912. Saxonia. 257. J. M. McCullough *Cat.* 1913. Ohio Chief. 258. Tait *Cat.* 1913. Maximus. 259. Leonard *Cat.* 1913. Mauretania. 260. Wood, Stubbs, *Cat.* 1913. Blue Ribbon Chieftain. 261. Williams *Cat.* 1918. Record Breaker. 262. Reuter *Cat.* 1918. Peerless Extra Early. 263. Galloway *Cat.* 1924. Eversure.

TOM THUMB GROUP

1. Russell *Cat.* 1827. Dwarf Spanish or Fan. 2. *Hort. Reg.* 3:207. 1834. Early Spanish Dwarf, Knoxes (Knox's in 3) Dwarf, Common Spanish Dwarf, Dwarf Crooked Sugar, Eventail, Early France Sugar, Dwarf Bog. 3. *Gard. Mag.* (London) No. 77. 1836. En Eventail, New Early Spanish Dwarf. 4. *Gard. Chron.* 620. 1842. Knox Dwarf. 5. Burr *Field. Gard. Veg.* 547. 1863. Strawberry. 6. Hogg *Gard. Yr. Bk.* 14:75. 1873. Spanish Dwarf. 7. *Hort. Reg.* 3:208. 1834. Late Spanish Dwarf, Très nain de Bretagne. 8. *Gard. Chron.* 53. 1850. Très nain De Brest. 9. N. Y. Sta. *Rpt.* 3:265, 273. 1885. Very Dwarf Bretagne, Nain de Keroulas, Extra Early Dwarf Breton or Brittany. 10. Vilmorin-Robinson *Veg. Gard.* 515. 1920. Very Dwarf Brittany. 11. Landreth *Cat.* 1832. Early Bishop's Dwarf Prolific. 12. *Hort. Reg.* 3:207. 1834. Bishop's Dwarf Prolific. 13. *Gard. Mag.* No. 77. 1836. Bishop's Dwarf. 14. Sinclair *Cat.* 1839. Bishop's Early Dwarf. 15. Douglas *Cat.* 1843. Bishop's Early Dwarf Prolific. 16. Denaiffe *L.P.P.* 62. 1906. L'Évêque. 17. *Gard. Chron.* 82. 1848. Clarke's Ringwood. 18. *Country Gent.* 9:111. 1857. Clark's New Early Ringwood Marrow. 19. *Gard. Chron.* 3. 1858. 1, 1017. 1859. Tom Thumb. 20. *Florist* 300. 1860. Nain hâtif extra. 21. *Cot. Gard.* 25:232, 260. 1861. Beck's Gem, Royal Dwarf, Ringwood Marrow, Flanagan's Early, Beck's Marrow. 22. Burr *Field Gard. Veg.* 545, 549. 1863. Early Ringwood. 23. Burr in *Amer. Jour. Hort.* 7:222. 1870. Barr's Tom Thumb. 24. *Jour. Hort.* 48:379. 1872. Turner's Royal Dwarf, De Grace, Buchsbaum, Essex Rival (probably incorrect). 25. N. Y. Sta. *Rpt.*

3:264. 1885. Extra Early Dwarf Tom Thumb, Bush Pea, Sutton's Long-podded Tom Thumb, Beck's Early Gem. 26. Buckbee *Cat.* 1894. Strawberry. 27. Plant *Cat.* 1896. Plant's Earliest Dwarf. 28. Denaiffe *L.P.P.* 27. 1906. Nain très hâtif à chassiss, Nain Gontier. 29. Bolgiano, J. *Cat.* 1911. Blue Peter, incorrectly. 30. *Gard. Chron.* 781. 1845. Queen of the Dwarfs, Waite's. 31. *Jour. Hort. Soc. London* 4:270. 1849. Bishop's New Long-podded. 32. *Gard. Chron.* 53. 1850. Bishop's Long-pod. 33. *Ibid.* 487. 1857. Bishop's Dwarf Long-pod. 34. *Cot. Gard.* 25:260. 1861. Bishop's Improved. 35. N. Y. Sta. *Rpt.* 3:251. 1885. Bishop's Long-podded, Nain Bishop à longues cosses. 36. *Rural N. Y.* 11:15. 1860. Strawberry not Field Creeper. 37. *Amer. Agr.* 18:190 and 19:18. 1861; 20:207, 293. 1862; 28:45. 1869. (As 26), Strawberry Vine, Guinea Dwarf, (as 24, second and third). 38. *Gard. Chron.* 1238. 1866. Peabody. 39. L. c. Dwarf Waterloo. 40. Vick *Cat.* 1869. Dwarf Waterloo Marrow. 41. *Rural N. Y.* 42:554. 1883. Garden Pride. 42. N. Y. Sta. *Rpt.* 3:251. 1885. Very Dwarf Coutourier. 43. *Ann. Hort.* 123. 1889. Reed's Early Dwarf Prize, Reed's Early Prize. 44. Porter Walton Co. *Cat.* 1922. Dwarf Prize. 45. Fla. Sta. *Bul.* 14:18. 1891. McNeil. 45a. U. S. D. A., B. P. I., *Bul.* 21:285. 1903. McNeil. 46. Hastings *Cat.* 1922. Florida McNeil. 47. *Ann. Hort.* 184. 1892. Very Dwarf Rural New Yorker. 48. Leonard *Cat.* 1913. D'Anonay Amelior. 49. Vilmorin-Andrieux *Cat.* 1892. Nain tres hatif d'Annonay. 50. Simon-Louis Freres *Cat.* 1922-23. Annonay Very Early. 51. Elgin Seed Co. *Cat.* 1913. Northern Wonder.

MARROWFAT GROUP

1. Parkinson *Par. Ter.* 522. 1629. White Rouncival, Hastings. 2. Mawe-Abercrombie *Univ. Gard. Bot.: Pisum.* 1778. Egg. 3. Switzer *Cat.* 1731. (rptd. *Gard. Chron.* 3d ser. 24:89. 1898). Marrowfats. 4. Mawe-Abercrombie. *Univ. Gard. Bot.: Pisum.* 1778. Tall Marrowfat, Dwarf Marrowfat, Large White Marrowfat. 5. *Hort. Reg.* 3:242. 1834. Tall Marrow, Large Improved Marrowfat, Tall Carolina, Sanspareil, De Marly, New Tall Temple, Clive, Wootten, Princess, Large Carolina, Suisse. 6. Douglas *Cat.* 1843. Giant Marrowfat. 7. Thorburn *Cat.* 1844. Giant Marrow. 8. *Gard. Chron.* 52. 1852. Large Imperial Marrow, Princesse, Suisse. 9. Thompson *Gard. Asst.* 320. 1859. Large Imperial Marrow Fat. 10. Burr *Fld. Gard. Veg.* 548. 1863. Tall White Marrow. 11. Landreth *Cats.* 1824, 1832. Large Marrowfat. 12. Landreth *Cat.* 1892. Irish Large White Marrowfat. 13. Condon *Cat.* 1922. English Marrowfat. 14. *Hort. Reg.* 3:209. 1834. Dwarf White Prussian, Stowe Prolific, New Dwarf Norman, White Prolific, Poor Man's Profit, Tall Prussian, New Tewslly, Tweesly Marrow, Wrenches (Wrench's in 20) White Union, Dwarf Tewslly, Royal Dwarf, Royal Dwarf Marrow, Royal Prolific. 15. *Ibid.* 3:241. 1834. Dwarf White Marrow, Early Rhenish Marrow, Dwarf Marrow, Wabash, Glory of England, Sans parchemin demi rames (incorrectly?), (as 5, fourth). 16. Lawson *Agr. Man.* 78. 1834. Dwarf Prolific. 17. *Gard. Chron.* 713. 1841. American Dwarf. 18. *Ibid.* 53. 1850. Hâtif à la moelle d'Angleterre, Hâtif à la moelle Espagne. 19. Hovey *Cat.* 1859. Early Dwarf Marrowfat. 20. Thompson *Gard. Asst.* 319. 1859. Dwarf White Prolific. 21. *Amer. Home Gard.* 163. 1860. Missouri Marrowfat. 22. Burr *Fld. Gard. Veg.* 533. 1863. Early Dwarf Marrowfat. 23. *Amer. Hort. Ann.* 135. 1867. Brown's Dwarf Marrowfat. 24. N. Y. Sta. *Rpt.* 3:243. 1884. Brown's New Dwarf Early Marrowfat. 25. Perry *Cat.* 1892. White Royal Dwarf Marrowfat. 26. Vilmorin-Andrieux *Les Pl. Pot.* 471. 1883. White Russian. 27. Parkinson *Par. Ter.* 522. 1629. Scottish, Tufted, Rose. 28. Mawe-Abercrombie *Univ. Gard. Bot.: Pisum.* 1778. Crown, Painted Lady Crown, Cluster. 29. *Hort. Reg.* 3:242. 1834. American Crown, Turc ou couronne, Turc à fleur blanc (fleurs blanches in 32). 30. Lawson *Agr. Man.* 81. 1834. White Crown. 31. *Cultivator* 2(3):131. 1846. Ribbon Stalk. 32. *Gard. Chron.* 52. 1850. Paquette. 33. *Jour. Hort.* 48:379. 1872. Bunch, Mummy. 34. *Gard. Chron.* 41. 1873. Royal Belshazzar, probably Grimstone's Egyptian. 35. Roy. *Hort. Soc. Jour.* 26:279. 1901. Tree Pea Eccentric. 36. Denaiffe *L.P.P.* 151. 1906. P. à ombelles, P. paquet. 37. Russell *Cat.* 1828. Ladies' Finger Marrow. 38. *Jour. Hort. Soc. London* 4:270. 1849. Lady's Finger. 39. Vilmorin-Robinson, *Les. Pl. Pot.* 433. 1883. Doigt de dame. 40. Russell *Cat.* 1827. Matchless, or True Marrowfat. 41. U. S. Pat. Off. *Rpt. (Agr.)* 1859. Matchless Marrow. 42. *Florist* 301. 1860. Stradsett Marrow. 43. *Jour. Hort.* 1:62. 1861. Milford Marrowfat, Stradsett Marrow. 44. *Gard. Chron.* 818. 1842. Young's Large Milford Marrowfat. 45. Lawson *Agr. Man.* 82. 1834. Grotto, or Mossy-podded. 46. *Gard. Chron.* 333. 1848. Oyster pea. 47. *Ibid.* 755. 1843. Shillings new early Grotto; and 373. 1844. Shilling's Grotto. 48. Warren's Gard. & Nurs. *Cat.* 1845. New Grotto Marrow, Skillings Early Marrow. 49. Thorburn *Cat.* 1847. Early Grotto. 50. Lawson *Agr. Man.* 73. 1834. Carolina. 51. *Ibid.* 81. 1834. Wellington. 52. *Hort. Reg.* 3:241. 1834. New Dwarf Pea, Prolific Isle of France. 53. *Gard. Mag.* No. 77. 1836. Donn's (Donne's) New Branching Marrow. 54. *Jour. Hort. Soc. London*, 4:271. 1849. Dwarf Branching Marrow, Grimstone's Egyptian. 55. *Gard. Chron.* 923. 1858. Kite's Branching Marrow. 56. *Florist* 300. 1860. Branching Victoria, Paul's Prolific. 57. *Cot. Gard.* 25:291. 1861. Paul's Early Dwarf. 58. *Jour. Hort.* 48:380. 1872. Victoria Branching. 59. Rogers *Veg. Cult.* 229. 1839. Royal Victoria. 60. *Gard. Chron.* 66. 1844. Victoria Marrow. 61. Hovey *Cat.* 1859. Victoria Tall Marrowfat. 62. *Jour. Hort.* 1:29. 1861. Gibb's Defiance, Waterloo Marrow, Giant Marrow (as 5 first, 51, 59). 63. *Gard. Chron.* 3rd ser. 26:99. 1898. Thurston's Reliance. 64. Denaiffe *L.P.P.* 1906. À la moelle de Victoria, Sarry, De Prusse. 65. *Gard. Chron.* 344. 1845. American Marrow. 66. *Ibid.* 2. 1846; 542. 1847; and 115. 1849 (as 34, second and 33, last). 67. *Rural N. Y.* 33:265. 1874. Andersonian Mummy. 68. *Gard. Chron.* 798. 1845. Dancer's Monastery. 69. *Rural N. Y.* 47:558. 1888. Aroostook Marrowfat. 70. *Gard. Chron.* 661, 819. 1852. Paradise Marrow; 465. 1857. Excelsior Marrow; 508. 1858. Mein's Paradise; 1017. 1859. Early Paradise Marrow; 21. 1860. Champion of Paris. 71. *Cot. Gard.* 25:291. 1861. Excelsior, Knight's Excelsior, Stuart's Paradise. 72. *Gard. Chron.* 925. 1867. Giant Early Marrow. 73. *Ibid.* 1129. 1861. Princess Royal; and 925. 1867. Cattell's Kent Rival. 74. (as 20). 75. *Amer. Agr.* 20:260. 1861. Great Eastern. 76. *Country Gent.* 20:127. 1862. Good's New Marrow. 77. Hogg *Gard. Yr. Bk.* 14:75. 1873. Leopold II. 78. Ms. notes N. Y. Sta. 1886. Erfurt Early Dwarf White Marrow. 79. *Ann. Hort.* 124. 1889. Short Straw Marrow. 80. Gregory *Cat.* 1890. Marblehead Early Marrowfat. 81. Burpee *Cat.* 1917. Marblehead Marrowfat. 82. Ms. notes N. Y. Sta. 1886. Giant Podded Marrow. 83. *Amer. Gard.* 19:202. 1898. Improved Stratagem. (?) 84. S. Dak. *Bul.* 91:7. 1905. Improved Sugar Marrow. 85. Tait. *Cat.* 1914. Improved White Sugar Marrowfat. 86. J. Bolgiano *Cat.* 1914. Improved Sugar Marrowfat. 87. Buckbee *Cat.* 1913. Mammoth Podded Sugar Marrowfat. 88. Moore & Simon *Cat.* 1907. Early Sugar Marrowfat. 88a. California *Cat.* 1913. California Marrowfat. 89. Carter *Cat.* 1913. Springtide. 90. Allan *Cat.* 1913. White-eyed Marrowfat. 91. Fuller, Stacy, Blackwell, *Cat.* 1688 (rptd. in *Gard. Chron.* 24 (3d ser.):107. 1898). (As 2). 92. Lawson *Agr. Man.* 74. 1834. Large Egg, Bean. 93. *Amer. Gard. Mag.* 2:431. 1836. Funnel's Black-spotted. 94. *Gard. Chron.* 52. 1850. Patagonian. 95. *Ibid.* 1017. 1859. Black-eyed Susan. 96. Switzer, Stephen *Cat.* 1731. (rptd. in *Gard. Chron.* (3d ser.) 24:89. 1898). Spanish Mulatto. 97. Mawe-Abercrombie *Univ. Gard. Bot.: Pisum.* 1778. Spanish Moratto. 98. Lindley *Guide Orch. Gard.* 567. 1831. Spanish Morotto. 99. *Gard. Mag.* No. 77. 1836. Spanish Marotta, A œil noir, Michaux à œil noir, Tall Black-spotted Marotta, Blackspotted. 100. Rogers *Cult.* 231. 1839. Spanish Marotto. 101. Switzer Stephen, *Cat.* 1731. (rpt. *Gard. Chron.* (3d ser.) 24:89. 1898). Nonsuch, or Pearl. 102. McMahon *Amer. Gard. Cal.* 582. 1806. Nonesuch. 103. *Hort. Reg.* 3:212. 1834. Tall Black Rouncival, Clematow carre feve. 104. Douglas *Cat.* 1843. New Dwarf Green Nonesuch. 105. Dunlap & Thompson *Cat.* 1847. Woodford Marrow (incorrectly). 106. White, J. *Cat.* 1846. Large Black-eyed Marrowfat. 107. *Rural N. Y.* 10:59. 1854. Black-eye. 108. U. S. Pat. Off. *Rpt. (Agr.)* 1865. Black Eye Marrowfat. 109. *Gard. Chron.* 509. 1882 (2). Symes' Black Eyed Marrowfat. 110. N. Y. Sta. *Rpt.* 3:242. 1884. Black Eyed Marrow, Black Eyed Marrowfat. 111. Landreth *Cat.* 1885. Peruvian Black Eye Marrowfat. 112. *Ann. Hort.* 124. 1889. Peruvian Black Eye Marrow. 113. *Cot. Gard.* 25:232. 1861. Telegraph.

ALASKA GROUP

1. Parkinson *Par. Ter.* 522. 1629. Green Hastings, Rouncivals. 2. Mawe-Abercrombie *Univ. Gard. Bot.: Pisum.* 1778. Green Nonpareil. 3. *Hort. Reg.* 3:208. 1834. Blue Prussian, Nain Royal, Nain vert petite, Fine Long Podded Dwarf, Dwarf Blue Prussian, Early Dutch Green, Early Green, Green Prussian. 4. Lawson *Agr. Man.* 97. 1834. Woodford's Green Marrow, Nonpareil. 5. Booth *Cat.* 1810. Royal Blue Prussian. 6. Thompson *Gard. Asst.* 321. 1859. Blue Prolific, Green Prolific, Blue Union. 7. Vilmorin-Andrieux *Les Pl. Pot.* 442. 1883. Nain vert gros, Bleu, (as 3, first). 8. Denaiffe *L.P.P.* 76. 1906. Nain vert Imperial, Grune Prussiche. 9. Central Exptl. Farm (Canada) *Bul.* 36:16. 1900. Prussian Blue. 10. *Gard. Chron.* 103, 329. 1841; and 620. 1842. Groom's Superb Dwarf Blue, Groom's Superb Early Dwarf Blue. 11. Russell *Cat.* 1827. New Nonpareil Marrowfat. 12. U. S. Dept. Agr., B. P. I. *Bul.* 21:280, 287. 1903. (As 4 second), Extra Early Nonpareil. 13. Landreth *Cat.* 1824. Grand Imperial. 14. *Ibid.* 1832. Blue Imperial. 15. *Hort. Reg.* 3:208. 1834. (As 14, name), Imperial, Tall Green Imperial, Dwarf Green Imperial, Dwarf Imperial, Sumatra Dwarf Blue Imperial, New Long-podded Imperial, Sans Parchemin vert (undoubtedly incorrect), Scymetar, Dwarf Blue Marrow, New Dwarf Prolific, New Sabre, Blue Sabre, Blue Scymetar, New Improved Dwarf Imperial, Dwarf Sabre, Sabre. 16. Denaiffe *L. P. P.* 75. 1906. À la Reine, Bleu à courte tige. 17. *Gard. Chron.* 344. 1845. Bedman's Imperial. 18. McIntosh *Bk. Gard.* 2:56. 1855. Bedman's Dwarf Imperial. 19. Dunlap & Thompson *Cat.* 1847. Knight's New Imperial. 20. *Amer. Agr.* 28:45. 1869. Imperial Blue. 21. *Gard. Chron.* 3rd ser. 3:181. 1888. Imperial Dwarf Blue. 22. Lawson *Agr. Man.* 79. 1834. (As 4). 23. Hovey *Cat.* 1834-5. Woodford's New Tall Prolific. 24. Rogers *Veg. Cult.* 228. 1851. Nonsuch. 25. Douglas *Cat.* 1843. Woodford New. 26. *Jour. Hort.* 1:63. 1861. Woodford's Marrow. 27. *Gard. Chron.* 713. 1841. Flack's Victory, Flack's New Large Victoria. 28. Thorburn *Cat.* 1847. Flack's Improved Imperial. 29. *Jour. Hort.* 1:116. 1861. Flack's Imperial, Flack's Victoria. 30. *Gard. Chron.* 713. 1841. Flack's Dwarf Blue Victory. 31. *Mag. Hort.* 11:136. 1845. Flack's Dwarf Victory. 32. *Country Gent.* 9:75. 1857. June. 33. Michell *Cat.* 1902. Early June. 34. *Gard. Chron.* 1497, 1500. 1870. Eastes' Kentish Invicta. 35. N. Y. Sta. *Rpt.* 3:256. 1885. East's Kentish Invicta. 36. Denaiffe *L.P.P.* 140. 1906. Kentish Invicta, East Kentish Invicta. 37. *Gard. Chron.* 1544. 1871. Griffin. 38. *Ibid.* n. ser. 16:1264. 1871. Carter Invicta. 39. *Ibid.* 934. 1872. First Crop Blue. 40. *Ibid.* n. ser. 16:666. 1881. Laxton's Earliest of All. 41. *Letter J. T. Moreland* (Pres., Geo. Tait & Sons), Dec. 14, 1922. Victor. 42. *Gard.*

Chron. n. ser. 20:651. 1883. Harrison's Eclipse. 43. *Rural N. Y.* 41:543. 1885. Smilax. 44. *Gard. Chron.* n. ser. 22:377. 1884. First and Earliest, Cleveland's. 45. *N. Y. Sta. Rpt.* 3:256. 1884. Express. 46. *Rural N. Y.* 44:756. 1885. Alaska. 47. Denaiffe *L.P.P.* 139. 1906. Blue Alaska. 48. Darling & Beahan *Cat.* 1913. Improved Alaska. 49. Steckler *Cat.* 1917. Early Alaska. 50. Notes taken at N. Y. Station, 1886. Maule's Earliest of All. 51. *Gard. Chron.* n. ser. 25:103. 1886. Earliest Blue. 52. *Rural N. Y.* 45:415. 1886. Clipper. 53. *N. Y. Sta. Rpt.* 6:531. 1888. Advance. 54. *Rural N. Y.* 47:113. 1888. Blue Beauty. 55. *Kans. Sta. Rpt.* 258. 1888. McBeth's Pride. 56. *Ann. Hort.* 124. 1889. McBeth's Bride. 57. *Kans. Sta. Rpt.* 156. 1889. Sitka. 58. Dreer *Cat.* 1899. Electric, Extra Early "Electric." 59. Salzer *Cat.* 1900. Scorchers. 60. *Gard. Chron.*

3rd ser. 30:6. 1901. Le Rapide. 61. Johnson & Stokes *Cat.* 1903. Large-podded Alaska. 63. Mich. Seed Co. *Cat.* 1906. Saginaw Valley's Pride. 64. *Rice Cats.* Rice's No. 330. 65. Iowa *Cat.* 1909. Velocity, Cooper's Velocity. 66. Bolgiano, J. *Cat.* 1910. Long-pod Alaska. 67. Allan *Cat.* 1913-4. Allan's Concordia. 68. Barnard *Cat.* 1913. Goodwin's Prize-winner. 69. Bolgiano, J. *Cat.* 1910. Hustlers, The. 70. *Wis. Sta. Bul.* 382:13-15. 1926. Horal. 71. Tinsley *Cat.* 1911. Indianapolis Market. 72. Moore Seed Co. *Cat.* 1913. McLean's First of All. 73. *Roy. Hort. Soc. Jour.* 37:411. 1911; and 41:284. 1915. Giant Express, Giant Blue Express. 74. U. S. Dept. Agr., B. P. I. *Bul.* 21:278. 1903. Earliest Perfection. 75. Dreer *Cat.* 1911. Market Surprise.

SCIMITAR GROUP

1. Fuller, Stacy, Blackwell, *Cat.* 1688. Sickles. 2. Lawson *Agr. Man.* 73. 1834. White Sickles. 3. *Ibid.* 75. 1834. Blue Scimitar. 4. *Gard. Chron.* 65. 1854. Blue Scimitar. 5. Thompson *Gard. Asst.* 320. 1859. Sabre, Blue Sabre, Dwarf Sabre, New Sabre (all probably incorrect, as Sabre is an incurved, not a recurved pea). 6. Burr *Fld. Gard. Veg.* 524. 1863. Blue Ciméter, Beck's Eclipse. 7. *Bon. Jard.* 269. 1832. D'Auvergne, d'Auvergnay. 8. Barrett *Cat.* 1836. Dwarf Scymetar. 9. Rogers *Veg. Cult.* 28. 1839. Scymetar-podded. 10. *Gard. Chron.* 713. 1841. Auvergne. 11. *Ibid.* 66. 1844. Scimitar. 12. Dunlap & Thompson *Cat.* 1847. Ciméter or (as 1). 13. *Cot. Gard.* 25:260. 1861. White Sabre, White Scimitar. 14. *N. Y. Sta. Rpt.* 3:257. 1885. Serpette, Cosaque, Crochu. 15. Denaiffe *L.P.P.* 125. 1906. Crochublan, Faucille, French Canner. 16. Thorburn *Cat.* 1892. Petit Pois. Small Early French. 17. Dreer *Cat.* 1894. (12, first) = French Canner. 17a. Breck *Cat.* 1913 (12, first) = Clamart hâtif. 18. Carter *Amer. Cat.* 1923 (12, first) = Delicatesse. 19. Vilmorin-Robinson *Veg. Gard.* 502.

1900. Long-podded Improved Scimitar. 20. Carter *Cat.* 1925. Giant Delicatesse. 21. *Gard. Chron.* 508. 1858. Banksian Marrow. 22. *Ibid.* 1017. 1859. Batts Wonder. 23. *Country Gent.* 20:207. 1862. Blue Sickles. 24. *Gard. Chron.* 172. 1866. Carter's Surprise, Flack's Imperial. 25. *Gard. Chron.* 711. 1867. Laxton's Supreme. 26. *N. Y. Sta. Rpts.* 3:245. 1885. Auvergne Green, Serpette vert, Grüne Auvergne; and 4:186. 1886. Green Auvergne. 27. *Gard. Chron.* 1612. 1871. Evergreen. 28. *Gard. Chron.* 1280. 1869. Carter's Hundred-fold, Cook's Favorite. 29. Vilmorin-Andrieux *Les. Pl. Pot.* 431. 1883. Merveille d'Étampes. 30. *N. Y. Sta. Rpt.* 3:252. 1885. Étampes Wonder. 31. Haage & Schmidt. *Cat.* 1886. Ruhm von Cassel. 32. *N. Y. Sta. Rpt.* 5:248. 1887. Glory of Cassel. 33. Northrup *Cat.* 1892. Sapphire. 34. Haage & Schmidt *Cat.* 1899. Gold von Blocksburg. 35. Kelway *Cat.* 1919. Early Somerset. 36. Lawson *Agr. Man.* 76. 1834. Blue Spanish Dwarf. 37. *N. Y. Sta. Rpt.* 5:248. 1887. Sword, White Sword, Sabre, Beak, and Green Sword, Sabre or Beak.

DIMPLED-SEEDED GROUP

1. *Hort. Reg.* 3:243. 1834. Tall Green Marrow, New Large Green Marrow, Valley Field, Imperial Green Marrow, South Sea. 2. *Gard. Mag.* No. 77. 1836. Green Tall Marrow. 3. Thompson *Gard. Asst.* 321. 1859. Late Green Marrow. 4. *Florist* 301. 1860. Denyer's Early Prolific Green Marrow, Sutton's Berkshire Hero, Garbutt's Amazon. 5. *Gard. Chron.* 292. 1865. Denyer's Early Prolific. 6. *Gard. Chron.* 818. 1842. Improved Green Marrow. 7. Lawson *Agr. Man.* 79. 1834. Early Green Marrowfat. 8. *Ibid.* 76. 1834. Groom's New Superb, Blue Dwarf. 9. *Gard. Mag.* No. 77. 1836. Groom's Superb Blue, Groom's Superb Dwarf Blue. 10. Rogers *Veg. Cult.* 228, 229. 1839. Groom's Superb Dwarf Blue Spanish Dwarf. 11. *Gard. Chron.* 103, 329. 1841; 620. 1842; 66. 1844. Groom's Superb Early Dwarf Blue, Groom's Superb. 12. *Jour. Hort.* 1:62. 1861. Blue Fan. 13. *Gard. Chron.* 769. 1846. Early Green Marrow. 14. *Ibid.* 8. 1847. Green Wrinkled Marrow. 15. *Ibid.* 1017. 1859. New Green Marrow. 17. *Ibid.* 17. 1849. Bellamy's Early Green Marrow. 18. *Amer. Gard. Mag.* 15:156. 1849. Burbidge's Eclipse. 19. *Gard. Chron.* 18. 1850. Burbidge's Eclipse. 20. McIntosh *Bk. Gard.* 2:56. 1855. Burbidge's Eclipse. 21. *Gard. Chron.* 66. 1844. Stubbs' New Dwarf. 22. *Ibid.* 673. 1849. Stubbs' Early Dwarf Blue Marrow. 23. *Ibid.* 508. 1858. Stubbs' Blue Marrow. 24. *Jour. Hort.* 1:116. 1861. Stubb's Dwarf. 25. *Gard. Chron.* 68. 1850. Gros vert Normande. 26. *N. Y. Sta. Rpt.* 3:245. 1885. Large Green Normandy. 27. *Gard. Chron.* 834. 1854. Prizetaker. 28. *Ibid.* 1017. 1859. Beck's Prizetaker, Prizetaker Green Marrow, Rising Sun. 29. *Jour. Hort.* (Cot. Gard.) 1:29. 1861. Leicester Defiance. 30. *Gard. Chron.* 292. 1865. Bellamy's Green Marrow, (as 29), or Noble's Green Marrow. 31. *Ibid.* 925. 1867. Green Prolific, Grotto. 32. *Ibid.* 488. 834. 1854. 1017. 1859. Dickson's Favorite, Dickson's Early Favorite, Torwoodlee. 32a. Hogg *Gard. Yr. Bk.* 14:74. 1873. Dickson's Favorite Improved, The Wonder, Cottrell's Wonder. 33. *Ibid.* 832. 1855. Harrison's Glory, Harrison's Perfection. 34. *Ibid.* 770, 832. 1855. Denyer's New Prolific Green Marrow, Denyer's Early Marrow. 35. *Ibid.* 292. 1865. Denyer's Early Prolific, (as 1, first). 36. *Gard. Chron.* 771. 1856. Semi-smooth-seed, (as 28, last). 37. *Florist* 301. 1860. (as 17). 38. *Gard. Chron.* 1. 1857. (as 4, last). 39. *Jour. Hort.* 1:62. 1861. (as 4, first). 40. *Gard. Chron.* 487. 1857. Glory. 41. *Ibid.* 17. 1858. Gilson's Glory. 42. *Ibid.* 1017. 1859. (as 29). 43. *Ibid.* 50, 1017. 1859. Sutton's Berkshire Hero. 44. *Florist* 301. 1860. (as 1, first). 45. *Gard. Chron.* 1017. 1859. Competitor. 46. *Florist* 301. 1860. Tall Green Wrinkled Mammoth. 47. *Gard. Chron.* 734. 1867. Tall Green Mammoth. 48. Burr *Fld. Gard. Veg.* 544. 1863. Noble's Early Green Marrow. 49. *Gard. Chron.* 5. 1864. Harrison's Royal Blue. 50. *Ibid.* 1151. 1865. Laxton's Prolific Early Long-pod. 51. *Ibid.* 925. 1867. Laxton's Prolific Long-pod. 52. Evans *Cat.* 1868. Laxton's Prolific. 53. *Amer. Jour. Hort.* 5:280. 1869. Laxton's Early Prolific Long-pod. 53a. Hogg *Gard. Yr. Bk.* 14:80. 1873. Laxton's Prolific Selected.

54. *Gard. Chron.* 660. 1868. William the First. 55. *N. Y. Sta. Rpt.* 3:257. 1885. Laxton's William the First, A grain rond vert William. 56. *Gard. Chron.* n. ser. 2:618. 1887. William the Conqueror. 57. *Ibid.* 660. 1868. Leader. 58. *Jour. Hort.* 48:400. 1872. Blue Peter. 59. *N. Y. Sta. Rpt.* 3:266. 1885. McLean's Blue Peter, Peter, Blue Tom Thumb. 60. *Gard. Chron.* 1199. 1872. Fillbasket. 61. *Ibid.* 1662. 1873. Laxton's Fillbasket. 62. Denaiffe *L.P.P.* 69. 1906. Plein-le-Panier. 63. Moore & Simon *Cat.* 1907. Simon's Fillbasket. 64. *Gard. Chron.* 134. 1878. Culverwell's Telegraph. 65. *Rural N. Y.* 42:288. 1883. Telegraph. 66. *N. Y. Sta. Rpt.* 7:136. 1889. Long Island Mammoth. 67. Landreth *Cat.* 1893. Main Crop, Long Island Marrowfat. 68. Allan *Cat.* 1914. Improved Telegraph. 69. *Jour. Roy. Hort. Soc.* 36:722. 1910. New Telegraph. 70. Kelway *Cat.* 1922. Super Telegraph, Early Telegraph. 71. *Gard. Chron.* 134. 1878. Carter's Challenger. 72. *N. Y. Sta. Rpt.* 3:244. 1885. Challenger. 73. *Gard. Chron.* 612. n. ser. 1880. Early Sunrise. 74. *Rural N. Y.* 40. 498. 1881. Day's Early Sunrise. 75. *Gard. Chron.* 19 or 20 (n. ser.):20. 1883. Day's Sunrise. 76. *Jour. Hort.* 3:3d ser.:82. 1881. Pride of the Market. 77. *Gard. Chron.* 107. 1883. Gladiator. 78. *Rural N. Y.* 44:496. 1885. Atlantic. 79. *Ibid.* n. ser. 18:807. 1882. Laxton's Evolution. 80. Henderson *Cat.* 1892. Evolution. 81. *Gard. Chron.*, n. ser. 22:340. 1884. Early Bird. 82. *Gard. Chron.*, 3rd ser. 2:619. 1887. Kenilworth. 83. Hogg *Gard. Yr. Bk.* 14:89. 1873. Green Noyou (Noyon). 84. *N. Y. Sta. Rpt.* 3:267. 1885. Dwarf Green St. Michael. 85. *Gard. Chron.* n. ser. 24:181. 1885. Ameer. 86. Alexander *Cat.* 1911. Large-podded Alaska. 87. Allan *Cat.* 1914. Long-podded Alaska. 88. Farmer *Cat.* 1914. Large Alaska. 89. Buckbee *Cat.* 1918. Bountiful. 90. Buist *Cat.* 1922. Claudit. 91. Denaiffe *L.P.P.* 142. 1906. Emir. 92. *Gard. Chron.* n. ser. 25:64. 1886. British Lion. 92a. Marshall *Cats.* Lion. 93. *Gard. Chron.* 3rd ser. 3:6. 1888. Early William. 94. *Ibid.* 181. 1888. Imperial Dwarf Blue. 95. Angell *Cat.* 1892. Early Prize. 96. *Gard. Chron.* 3rd ser. 10:183. 1891. (As 89), Sutton's Bountiful. 97. S. Dak. Sta. *Bul.* 85:4. 1904. Early Bountiful. 98. Denaiffe *L.P.P.* 142. 1906. Bountiful Early. 99. Moore Seed Co. *Cat.* 1913. Bountiful Big Pod. 100. *Gard. Chron.* 3rd ser. 16:135. 1894. Yorkshire. 101. Daniels *Cat.* 1892. Lye's Favorite. 102. Squier *Circ.* 1900. (as 90). 103. U. S. Dept. Agr., B. P. I. *Bul.* 21:286. 1903. May Queen. 104. Griffith & Turner *Cat.* 1902. Dwarf Green Wrinkled Marrow. 105. Breck *Cat.* 1913. Old Glory. 106. *Jour. Roy. Hort. Soc.* 34:289. 1908. Pilot. 107. *Ibid.* 37:417. 1911. Primo. 108. Kelway *Cat.* 1922. Primo Pilot. 109. Hurst *Cat.* 1925. (As 107), or (as 106). 110. *Roy. Hort. Soc. Jour.* 46:387. 1921. Improved Pilot. 111. *Gard. Chron.* 3rd ser. 36:107. 1904. Carter's Eight Weeks. 112. Farmer *Cat.* 1914. Early Eight Weeks. 113. *Roy. Hort. Soc. Jour.* 29:681. 1905. Essex Star. 114. Denaiffe *L.P.P.* 73. 1906. Sunrise Blue, Carter's. 115. Schultz *Cat.* 1908. Wonderful Extra Early. 116. Noll *Cat.* 1907. Grand Monarch. 117. *Roy. Hort. Soc. Jour.* 34:289. 1908. Inter-

national. 118. Livingston Cat. 1908. Frost King. 119. Baker's Cat. 1912. Acquisition. 120. Sutton Cat. 1914. Sutton's Acquisition. 121. Sharpe Cat. (Aut.) 1910. Talisman. 122. L. c. Vanguard. 123. Tinsley Cat. 1911. Twentieth Century Giant. 124. *Jour. Roy. Hort. Soc.* 37:420. 1911. Superb. 125. Carter Cat. 1925. Carter's Early Superb. 126. Weeber Cat. 1913. Early Marvel. 127. *Jour. Roy. Hort. Soc.* 39:682. 1913. Eldorado. 128. *Ibid.* 677. 1913. Benefactor. 129. Kelway, *Letter*, May 26, 1926. Old England. 130. Simon Cat. 1915. Early Record. 131. Bolgiano, F. W. Cat. 1915. Earliest Springtime. 132. *Ibid.* 1924. Early Springtime. 133. *Jour. Roy. Hort. Soc.* 43:511. 1918. Johnson's Victor. 134. *Ibid.* 48:87. 1923. Victor. 135. Burpee Cat. 1917. Despatch. 136.

Stark Bros. Cat. 1921. Burpee's Extra Early Dispatch. 137. Kelway Cat. 1919. The Britisher. 138. L. c. Kelway Beauty. 139. Bolgiano, J. Cat. 1890. Morning Glory. 140. Grown at Idaho Sta. 1921. Warrior. 141. Schell Cat. 1924. Wonderful. 142. Kelway Cat. 1922. Councillor. (received as Kelway's Counsellor). 143. L. c. Tip Top. 144. Buist Cat. 1922. Early Klondike. 145. *Jour. Roy. Hort. Soc.* 47:88. 1922. Johnson's Glory. 146. Hurst Cat. 1923. Welcome. 147. Alneer Cat. 1922. Mammoth Extra Early. 148. Williams Cat. 1923. World Beater. 149. Charlton's Radio. 150. Maule, Burpee, Cats. 1924. Radio. 151. Hurst Cat. 1923. Ajax. 152. Western Cat. 1923. Hartner's Early Market (= Pilot). 153. Henderson Cat. 1926. Jubilant.

WRINKLED, CREAM-SEEDED GROUP

1. *Gard. Chron.* n. ser. 14:617. 1880. Minimum. 2. Gregory Cat. 1882. Laxton's Minimum. 3. *Roy. Hort. Soc. Jour.* 46:386. 1921. Mighty Atom. 4. Sutton Cat. 1898. Sutton's Harbinger. 5. *Rural N. Y.* 62:486. 1903. Harbinger. 6. Isbell Cat. 1914. Perfect Early. 7. Sutton Cat. 1908. Reading Wonder. 8. Clibran Cat. 1924. Masterpiece. 9. *Gard. Chron.* 1612. 1870. White Gem. 10. Hogg *Gard. Yr. Bk.* 14:95. 1873. Nutting's No. 1. 11. Rennie Cat. 1917. Earliest Table Marrow. 12. Thorburn Cat. 1909. Germania. 13. *Gard. Chron.* 734. 1867. Nelson's Vanguard. 14. Sutton Cat. 1887; also *Gard. Chron.* 3rd ser. 1:18. 1887; 3rd ser. 4:46. 1888. Chelsea Gem. 15. *Ann. Hort.* 123. 1889. Chelsea. 16. Hurst Cat. 1919. Chelsea Rival. 17. *Jour. Hort.* 48:379. 1872. Laxton's Nabob. 18. Kelway Cat. 1919. Referendum. 19. L. c. Allotment Holder. 20. Marlow Cat. 1913. Delicia or Delicatessen. 21. *Roy. Hort. Soc. Jour.* 39:690. 1913. Marvellous. 22. Laxton Cat. 1920. (as 21). 23. *Ibid.* 1925. Marvellous Improved. 24. Sutton Cat. 1906. Sutton's Pioneer. 25. Buist Cat. 1922. Dwarf Pioneer. 26. Sutton Cat. 1910. Sutton's Hundredfold. 27. Breck Cat. 1923. Early Lexington. 28. Williams Cat. 1918. New Era. 29. Henderson Cat. 1905. Melting Marrow. 30. Sutton Cat. 1896. Sutton's Early Giant. 31. *Ibid.* 1895. Sutton's Seedling Marrowfat. 32. *Gard. Chron.* 3rd ser. 10:133. 1891. Carter's Daisy. 33. *Rural N. Y.* 55:483. 1896. Daisy. 34. Gregory Cat. 1897. Carters Up-to-Date Pea (not intended as name, but so used in *Rural N. Y.* 55:483. 1896). 35. *Roy. Hort. Soc. Jour.* 29:682. 1905. Extra Early Daisy. 36. Bolgiano, J. Cat. 1911. Dwarf Telephone. 37. *Roy. Hort. Soc. Jour.* 48:86. 1923. Improved Daisy. 38. Lincoln *Circ.*, undated. The Lincoln. 39. Thorburn Cat. 1908. Lincoln. 40. Allan Cats. Allan's Canner. 41. Isbell Cat. 1912. Isbell's Beauty. 42. Johnson & Stokes Cat. 1896. Crown Prince. 43. *Gard. Chron.* 21:265. 1884. White Prolific Marrow. 44. Vaughan Cat. 1900. Sweet Market. 45. Vick Cat. 1920. First Choice. 46. Bolgiano, J. Cat. 1906. Wonder Worker. 47. *Gard. Chron.* 40. 1862. McLean's Wonderful. 48. *Ibid.* 172. 1866. Carter's Prince of Wales, Princess, Yorkshire Hero. 49. *Ann. Hort.* 194. 1891. Admiral. 50. Rogers Cats. Green Admiral. 51. *Gard. Chron.* 344. 1845. Lynn's Wrinkled Marrow, Black-eyed Susan. 52. McIntosh *Bk. Gard.* 2:56. 1855. Lynn's Prolific, Lynn's Prolific Wrinkled Marrow. 53. *Gard. Chron.* 1017. 1859. Lynn's Prolific Wrinkled. 54. *Ibid.* 2. 1860. McLean's Prolific. 55. *Ibid.* 96. 1873. James' Prolific Wrinkled Marrow. 56. Sutton Cat. 1898. Prolific Marrow. 57. *Roy. Hort. Soc. Jour.* 26:279. 1901. Prolific. 58.

Ibid. 27:206. 1902. Gradus. 59. *Gard. Chron.* 3rd ser. 12: 667. 1892. Laxton's Gradus. 60. Henderson Cats. 1897, "1897," 1898. Prosperity. 61. *Roy. Hort. Soc. Jour.* 26:273. 1901. Dwarf Gradus. 62. *Gard. Chron.* 835. 1856. Alliance. 63. *Ibid.* 802. 1856. Eugenie. 64. *Ibid.* 105. 1858. Early Eugene. 65. N. Y. Sta. *Rpt.* 3:254. 1885. Eugenia. 66. Denaiiffe *L.P.P.* 81. 1906. Ridé nain blanc hâtif, d'Alber sucré, White Eugenie. 67. *Gard. Chron.* 1257. 1868. Carter's Leviathan. 68. *Roy. Hort. Soc. Jour.* 26:273. 1901. Edward VII. 69. Carter Cat. 1913. Carter's Edward VII. 70. *Gard. Chron.* 49. 1847. Incomparable Marrow. 71. *Ibid.* 134. 1850. Ward's Incomparable, Green's Superb Tall Marrow. 72. *Ibid.* 169. 1848. British Queen. 73. Hogg *Gard. Yr. Bk.* 14:100. Hay's Mammoth, Tall White Mammoth, (as 67), Will Watch, Waite's Will Watch, Champion of Scotland. 74. *Florist*: 301. 1860. Tall Mammoth, Green's Superb, Cotton's Leviathan, Flannigan's Imperial, Great Britain, Royal Britain, Thorne's Royal Britain, Oxford Tom, Norfolk Marrow, Shanley Marrow, (as 67, first), Rollison's Victoria. 75. *Gard. Chron.* 3rd ser. 24:99. 1898. Hurst's Incomparable. 76. Sutton Cat. 1901. Duchess of York. 77. *Ann. Hort.* 124. 1889. Burpee's Profusion. 78. *Gard. Chron.* n. ser. 14:708. 1881. Yorkshire Gem. 79. *Roy. Hort. Soc. Jour.* 39:685. 1905. Prestige, given Award of Merit 1901 as Prolific Late Marrow. 80. *Roy. Hort. Soc. Jour.* 27:207. 1902. Royal Salute. 81. *Gard. Chron.* 3. 1859. (as 69, last). 82. *Jour. Hort.* 1:138. 1861. (as 69, last), (as 69, second), (as 67, first). 83. *Roy. Hort. Soc. Jour.* 39:685. 1913. Glory of Somerset. 84. Moore Seed Co. Cat. 1909. Royal Early. 85. *Gard. Chron.* 292. 1865. Prince of Wales. 86. *Jour. Hort.* 52:78. 1874. Standish's Criterion. 87. *Gard. Chron.* 707. 1853. Fairbeard's Nonpareil. 88. *Ibid.* 1283. 1868. Queen of the Marrows. 89. Veitch, J. Cat. 1907. Earliest Marrow. 90. Kelway Cat. 1913. Langport. 91. *Gard. Chron.* 53. 1842. British Queen. 92. *Florist* 301. 1860. Carter's Victoria. 93. *Gard. Chron.* 925. 1867. Hooper's Incomparable, Wonder, Cat-tell's Wonder. 94. Hogg *Gard. Yr. Bk.* 14:96. 1873. Hair's Defiance, Erin's Queen, (as 69a, fifth, seventh, ninth, last), Imperial Wonder, (as 63), McMillan's Queen of the Marrows, William's Emperor of the Marrows, Wonder of the World, Queen of the Marrows. 95. *Ibid.* n. ser. 21:19. 1884. St. Peter's Marrow, St. Heliers Marrow, (as 91). 96. *Gard. Chron.* 1017. 1859. Synonyms of Carter's Victoria (92): Carter's Eclipse, (as 74, seventh), Buckley's Gen. Windham. 97. *Ann. Hort.* 123. 1889. Apparently 81. 98. *Roy. Hort. Soc. Jour.* 39:694. 1913. Sir Arthur Bignold. 99. *Gard. Chron.* 1576. 1871. Emperor of Marrows.

GEM GROUP

1. *Gard. Chron.* 40. 1862. McLean's Little Gem. 2. Kans. Sta. *Rpt.* 1:153. 1889. Vaughan's Little Gem. 3. *Mag. Hort.* 33:81. 1867. Drew's New Dwarf. 4. *Rural N. Y.* 38:464. 1879; 42:488. 1883; 51:214. 1892. Bliss' American Wonder. 5. Simon-Louis Frères Cat. 1923. American Wonder Long-pod. 6. *Gard. Chron.* 216. 1876. The Shah. 6a. Denaiiffe *L.P.P.* 160. 1906. Shah de Persie. 7. *Country Gent.* 42:150. 1877. Extra Early Premium Gem. 8. N. Y. Sta. *Rpt.* 1:86. 1883. Premium Gem. 9. *Ibid.* 3:268. 1885. Carter's Premium Gem, (as 7). 10. Darling 1923. Darling's Gem. 11. Berry Seed Co. Cat. 1925, and *letter*, Feb. 18, 1927. Magnificent. 12. *Gard. Chron.* 18:807. 1882. William Hurst. 13. Ferry Cat. 1893. (as 12). 14. Denaiiffe *L.P.P.* 43. 1906. Serpette nain vert, Laxton's. 15. N. Y. Sta. *Rpt.* 7:138. 1889. Station. 16. *Rural N. Y.* 43:97. 1884. Arnold No. 2, Ever-bearing (Bliss'). 17. N. Y. Sta. *Rpt.* 3:260. 1884. Bliss' Ever-bearing. 18. Childs Cat. 1893. Child's Universal. 19. N. Y. Sta. *Rpt.* 3:268. 1885. Very Dwarf Wrinkled, Ridé très nain à bordures. 20. *Rural N. Y.* 43:544. 1884. Vermont Wonder. 21. *Ann. Hort.* 125. 1889. Vermont Wonder Gem. 22. *Rural N. Y.* 43:544. 1884. Vick's Dwarf. 23. *Ibid.* 4:463. 1885. Alexander's Cable. 24. N. Y. Sta. *Rpt.* 5:248. 1887. Sutton's Early Gem. 25. Vick Cat. 1892. King of the Dwarfs, Vick's. 26. Sutton Cat. 1903. King of the Dwarfs, Sutton's. 27. *Ibid.* 1887. Chelsea Gem. 28. Gregory Cat. 1888. Delicious. 29. *Ann. Hort.* 123. 1889. Epicure. 30. *Gard. Chron.* 3rd ser. 6:743. 1889. The Echo.

31. Sutton Cat. 1889. Perfect Gem, Sutton's. 32. Vaughan Cat. 1908. Perfect Gem, Vaughan's. 33. Kans. Sta. *Rpt.* 1:153. 1889. Tom Thumb (wrinkled). 34. Moore Seed Co. Cat. 1907. Tom Thumb Plentiful. 35. N. Y. Sta. *Rpt.* 9:293. 1891. Angel's (sic) Premier. 36. *Gard. Chron.* 3rd ser. 10:18. 694. 1891. English Wonder. 37. *Ann. Hort.* 194. 1891. Nott's Excelsior. 38. Angell Cat. 1892. Angell's Triumph. 38a. Everitt Cat. 1900. Empire State. 38b. U. S. D. A., B. P. I. *Bul.* 21:280. 1903. Extra Early Manifold. 38c. Griffith and Turner Cat. 1902. Admiral Dewey. 39. Sutton Cat. 1896. May Queen. 40. *Gard. Chron.* 3rd ser. 18:423. 1895. Witham Wonder. 41. *Rural N. Y.* 55:467. 1896. Nott's Perfection. 42. Gregory Cat. 1897. Gregory's Surprise. 43. Burpee Cat. 1901. Eclipse or (as 15). 44. Hastings Cat. 1907, probably earlier. Extra Early Surprise. 44a. Gregory Cat. 1898. (as 43, first.) 45. Sutton Cat. 1900. Little Marvel. 46. Alexander Seed Co. Cat. 1904. Durban's Market Garden. 47. S. Dak. Sta. *Bul.* 85:5. 1904. The Herald. 48. *Roy. Hort. Soc. Jour.* 28:197. 1903. Rivenhall Wonder. 49. Buckbee Cat. 1906. Extra Early Honey Sweet. 50. Gregory Cat. 1906. Early Excelsior. 51. Lilly Cat. 1907. Washington Wonder. 52. Vaughan Cat. 1908. Vaughan's Forcing. 53. Northrup Cat. 1907. Honey Sweets. 54. Allan Cat. 1913-14. Richard Seddon. 55. Bolgiano Cat. 1914. 100% Profit. 56. Routledge Cat. 1918. Duke's Delight. 57. Allan Cat. (Recent). Cannors' Gem.

LARGE PODDED DWARF GROUP

POINTED-POD SECTION

1. *Gard. Chron.* n. ser. 10:647. 1878. Marvel. 2. N. Y. Sta. notes. Green Prolific, Bennett's. 3. *Gard. Chron.* 3rd ser. 1:128. 1887. Matchless Marrow, Daniels'. 4. Sutton Cat. 1896. Matchless Marrowfat. 5. *Ibid.* Cat. 1912. Matchless. 6. Allan Cats. 1907, 1913. Dwarf Telephone, Allan's. 7. Maule Cat. 1905. Carter's Daisy. 8. Condon Cat. 1918. Dwarf Defiance. 9. Rice Cat. 1918. Rice's Improved Dwarf Telephone. 10. Western Cat. 1923. Mountain Telephone. 11. Sutton Cat. 1896. Sutton's Perfection Marrowfat. 12. *Gard. Chron.* 3rd ser. 18:96. 1895. Renterpayer. 13. Sutton Cat. 1896. Productive Marrowfat. 14. *Ibid.* 1896. Sutton's Forcing. 15. *Gard. Chron.* 3rd ser. 22:111. 1897. Early Morn. 16. *Ibid.* 3rd ser. 30:111. 1901. Carter's Early Morn. 17. Burpee Cat. 1901. Perfect. 18. *Gard. Chron.* 3rd ser. 28:16. 1900. Edwin Becket. 19. Johnson & Stokes Cat. 1901. Market Master. 20. Salzer Cat. 1901. Dwarf Jumbo. 21. Sutton Cat. 1901. Green Gem. 22. Barr Cat. 1912. Mikado. 23. *Roy. Hort. Soc. Jour.* 26:274. 1901. King Edward VII. 24. Carter Cat. 1913. King Edward VII Dwarf. 25. Northrup Cat. 1901. Matchless Wonder. 26. Bolgiano, J. Cat. 1901. Dwarf Giant Poded Prolific Green Marrow. 27. Burpee Cat. 1904. Prolific. 28. *Rural N. Y.* 44:463. 1885. Alexander's Prolific. 29. (See 93). 30. *Roy. Hort. Soc. Jour.* 36:715. 1910; and 37:423. 1911. Victor. 31. Breck Cat. 1913. Record, The. 32. Sutton Cat. 1907. World's Record. 33. Eckford Cat. 1906. Commander. 34. Ebbert Cat. 1906. Peacemaker. 35. Field Cat. 1901. Leonard's Clatawa. 36. Johnson Seed Co. Cat. 1909. Dainty Duchess. 37. *Gard. Chron.* 3rd ser. 42:114. 1907. Laxtonian. 38. Lilly Cat. 1907. Mount Ranier. 39. Sutton Cat. 1907. Pioneer, Sutton's. 40. *Ibid.* 1910. Discovery, Sutton's. 41. Carter Cat. 1913. Early Duke. 42. *Roy. Hort. Soc. Jour.* 46:386. 1921. Peter Pan. 43. *Ibid.* 37:413. 1911. Lancashire Lad. 44. Burpee 1912. Blue Bantam. 45. Farmer Cat. 1914. Giant Laxtonian, Dwarf Gradus. 46. Buckbee Cat. 1918. (as 45, first). 47. Condon Cat. 1922. (as 44, 45). 48. Darling Cat. 1913. Defiance. 49. Harnden Cat. 1913. Electric. 50. Adams Cat. 1924. Adams' Electric. 51. Condon Cat. 1913. Little Midget. 52. *Ibid.* 1918. Mammoth Poded Little Midget. 53. Sharpe Cat. 1913. Marchioness. 54. Ford Cat. 1915. Harvester. 55. Elliott Nursery Cat. 1916. Early but Good. 56. Sutton Cat. 1919. President Wilson. 57. Tait Cat. 1922. Dwarf Perfection. 58. Laxton Cat. 1922. Progress, Laxton's. 59. Bruce Cat. 1922. Regal. 60. Laxton Cat. 1923. Bedford Champion. 61. Carter Cat. 1925. Giant Stride. 62. Breck Cat. 1926. Warlock Prize. 62a. Letter El Paso Seed Co., Apr. 23, 1927. El Paso Wonder.

BLUNT-PODDED SECTION

63. *Gard. Chron.* 743. 1844. Satisfaction, Sutton's. 64. *Ibid.* 292. 1865. Dwarf Prolific, McLean's. 65. *Ibid.* 1531. 1870. Best of All, McLean's. 66. *Ibid.* 1152. 1863. Yorkshire Hero. 67. N. Y. Sta. Rpt. 3:261. 1885. (Probably) Turner's Wonderful, Carter's Prince of Wales and Princess of Wales, McLean's Favorite. 68. Northrup Cat. 1893. Big Gem. 69. Hallawell Cat. 1918. Alameda Sugar. 70. Morse Cat. 1918. Alameda Sweet. 71. Navlet Cat. 1918. Alameda Sweets. 72. Muzzy Cat. 1921. Dwarf Champion (incorrectly). 73. Ferry Cat. 1882. Dwarf Champion. 74. Gregory Cat. 1885. (p. 6) Dwarf Champion of England (described), (p. 35) (as 66) (listed, cross referenced p. 6). 75. Dreer Cat. 1905. New Dwarf Champion. 76. Beckert Cat. 1915. Juno. 77. *Rural N. Y.* 42:558. 1883. Horsford's Market Garden. 78. N. Y. Sta. Rpt. 4:186. 1886. Imperial Champion. 79. *Gard. Chron.* n. ser. 28:704. 1886. Sharpe's Queen. 79a. Rennie Cat. 1901. Rennie's Queen. 80. Northrup, 1899. Queen. 81. *Gard. Chron.* n. ser. 28:677. 1886. Sensation. 82. N. Y. Sta. Rpt. 7:134. 1889. Blue Wrinkled. 83. *Ibid.* 135. Dwarf Main Crop. 84. *Gard. Chron.* 3rd ser. 6:743. 1889. Renown. 85. Sutton Cat. 1895. Sutton's Favorite Marrowfat. 86. *Ibid.* 1896. Sutton's Excelsior. 87. Grand Junction Cat. 1924. Melting Marrow. 88. *Gard. Chron.* 3rd ser. 24:99. 1898. Pierrepont's Gem (incorrectly). 89. S. Dak. Sta. Bul. 91:7. 1905. Pierremont's Gem. 90. Sutton Cat. 1901. Sutton's Ideal. 91. Burpee Cat. 1904. British Wonder. 92. *Gard. Chron.* n. ser. 20:202. 1883. Eckford's Victor. 93. *Ibid.* 3rd ser. 36:108. 1904. Victor Marrowfat. 94. (see 30). 95. Sutton Cat. 1908. Sutton's Incomparable. 96. Portland Cat. 1909. Perfection. 97. Vaughan Cat. 1909. Top o' th' Morn. 98. Sutton Cat. 1910. Early Dwarf. 99. *Ibid.* 1914. Prince Arthur. 100. Rice Cat. 1918. Rice's Early Dwarf. 101. Sutton Cat. 1922. Reading Gem. 102. Salzer Cat. 1923. Record Breaker Six Weeks. 103. Grand Junction Cat. 1924. Bestever, Ward's.

DAISY SECTION

104. S. Dak. Sta. Bul. 85:4. 1904. (As 91). 105. *Gard. Chron.* 3rd ser. 36:107. 1904. Buttercup. 106. L. c., Mayflower. 107. *Roy. Hort. Soc. Jour.* 29:680. 1905. Daffodil. 108. Vick Cat. 1909. Swastika, "Good Luck." 109. Burnett Cat. 1913. Te Aroha. 110. Thorburn Cat. 1915. (As 108, second), (as 109). 111. Routledge Cat. 1918. Te-a-wha (evidently typographical error). 112. Ferry Cat. 1918. Connoisseur. 113. Sutton & Sons Cat. 1921. Sutton's Supreme. 114. Griswold, T. Cat. 1922. Superb Early Dwarf.

ADVANCER GROUP

1. *Gard. Chron.* 2:1860. McLean's Advancer. 2. *Ibid.* 292. 1865. Advancer. 3. Rice Cat. 1918. Improved Advancer. 4. *Gard. Chron.* 117. 1864. Princess of Wales. 5. *Ibid.* 172. 1866. (4) = McLean's Favorite. 6. *Ibid.* 711. 1867. Alpha, Laxton's. 7. N. Y. Sta. Rpt. 3:260. 1885. Early Alpha, Extra Early Alpha, Pois à grain ridé vert. 8. *Gard. Chron.* n. ser. 4:144. 803. 1875. Dr. McLean. 9. Sutton Cat. 1897. Improved Dr. McLean. 10. *Gard. Chron.* n. ser. 16:708. 1881. Edinburg Beauty. 11. *Gard. Chron.* n. ser. 20:713. 1883. Bliss' Abundance. 12. Rice Cat. 1922. Canners' Perfection [often spoken of as Davis' Perfection]. 13. *Rural N. Y.* 42:554. 1883. Racket, Horsford's. 14. N. Y. Sta. Rpt. 3:263. 1885. The Racket. 15. *Gard. Chron.* 3rd ser. 10:133. 1891. A 1, Sutton's. 16. *Roy. Hort. Soc. Jour.*

26:277. 1901. Exonian. 17. (As 5). 18. Gregory Cat. 1890. Favorite. 19. Burpee Cat. 1888. Quality, Burpee's; Quantity, Burpee's. 20. *Ann. Hort.* 194. 1891. The Mayor. 21. *Rural N. Y.* 58:498. 1899. Morning Star, Childs'. 22. Buckbee Cat. 1894. Startler. U. S. D. A., B. P. I. Bul. 21:274. 1893. Bruces C. P. R. 23. Griffith & Turner Cat. 1902. Gardener's Favorite. 24. Sutton Cat. 1906. Abundance. 25. Buckbee Cat. 1906. Vigorosa. 26. Hastings Cat. 1907. Home Delight. 27. Bolgiano, J. Cat. 1906. Cracker Jacks. 28. Johnson & Musser Cat. 1908. Wiltfong or Pride of Cahuenga. 29. Gurney Cat. 1909. Yankton Maincrop. 30. Breck Cat. 1913. Old Colony. 31. Sutton Cat. 1922. Delicacy.

STRATAGEM GROUP

1. *Gard. Chron.* n. ser. 14:70. 1880. Stratagem, Carter's. 2. *Roy. Hort. Soc. Jour.* 26:273. 1901. Danby Stratagem. 3. Allan Cat. 1914. Dandy Stratagem. 4. Burpee Cat. 1896. Improved Stratagem. 5. Farquhar Cat. 1906. Cox's Improved Stratagem. 6. *Gard. Chron.* n. ser. 14:617. 1880. John Bull. 7. *Ibid.* n. ser. 20:644. 1883. Triumph. 8. N. Y. Sta. Rpt. 7:138. 1889. Sharp's Triumph. 9. *Rural N. Y.* 45:218. 1886. Pride of America. 10. *Rural N. Y.* 51:215. 1892. Astonisher, Benham's. 11. Sutton Cat. 1896. John Lee, Dwarf Defiance. 12. *Rural N. Y.* 55:547. 1896. New Life. 13. Carter Cat. 1898. Majestic, Carter's. 14. *Rural N. Y.* 61:514. 1902. Nott's Prolific. 15.

Roy. Hort. Soc. Jour. 26:274. 1901. The Sherwood. 16. Routledge Cat. 1918. King Edward (probably erroneous). 17. *Roy. Hort. Soc. Jour.* 26:279. 1901. Magnum Bonum. 18. *Rural N. Y.* 61:253. 1902. Ambler's Magnum Bonum. 19. *Roy. Hort. Soc. Jour.* 27:204. 1903. Battleship, Carter's. 20. Maule Cat. 1909. Potlatch. 21. Schultz Cat. 1913. Big Marvel. 22. Breck Cat. 1913. Improved Champion. 23. Livingston Cat. 1908. Livingston's First Choice. 24. *Roy. Hort. Soc. Jour.* 37:418. 1913. Rent Payer. 25. De Giorgi Cat. 1914. Model, De Giorgi's. 26. Condon Cat. 1918. Ultimatum.

CHAMPION OF ENGLAND GROUP

1. Sinclair Cat. 1826. Knight's Tall Marrow. 2. *Hort. Reg.* 3:242. 1834. Dwarf Green Marrow, Knight's Pea, Knight's Late, Knight's New, Knight's New Dwarf, Pois ride. 3. Lawson Agr. Man. 80. 1836. Knight's Dwarf White Wrinkled Marrow, Knight's Tall White Wrinkled Marrow, Knight's Dwarf Marrow, Knight's Tall White Wrinkled Marrowfat, Knight's Improved White Wrinkled Marrowfat, Knight's Dwarf Green Wrinkled Marrowfat, Knight's Tall Green Marrowfat. 4. Rogers Veg. Cult. 227, 230, 231. 1839. Knight's Green Dwarf Wrinkled, Knight's Dwarf Wrinkled Marrow-

fat, Knight's Tall White Marrowfat, Knight's Tall Green Marrow. 5. *Gard. Chron.* 84, 327, 329, 713. Knight's Dwarf Green Marrow, Knight's Tall Marrow, Knight's Dwarf Green Marrowfat. 6. *Ibid.* 882. 1842. Knight's Blue Dwarf Wrinkled Marrowfat. 7. *Ibid.* 68. 1850. Knight's Late, Ridé ou de Knight, Ridé tardis, Knight's Tall White Marrow, Knight's Tall Blue Marrow. 8. Burr Fld. Gard. Veg. 541. 1863. Knight's Dwarf Blue Marrow. 9. N. Y. Sta. Rpt. 3:248. 1885. De Knight, De Knight Sucre, De Brazil. 10. N. Y. Sta. Rpt. 3:269. 1885. As synonyms of Knight

Dwarf Green Marrow: Ridé nain vert hâtif, and probably erroneous, Hair's Dwarf Green Marrow, Hair's Dwarf Mammoth, Napoleon, Climax. 11. *Gard. Chron.* 801. 1846. Champion of England, Fairbeard's. 12. Hovey *Cat.* 1849. Champion of England. 13. McCullough, J. Chas. *Cat.* 1902. Improved Champion of England. 14. *Gard. Chron.* 18. 1850. Hair's Dwarf Mammoth, Knight's Marrow; and 3rd ser. 22:276. 1897. Hairs' Dwarf Mammoth. 15. U. S. Pat. Off. *Rpt.* 314. 1856. (As 10, third). 16. Thompson *Gard. Asst.* 312. 1859. Hair's Dwarf Green Mammoth. 17. Evans *Cat.* 1868. Dwarf Green Mammoth. 18. Thorburn *Cat.* 1882. (As 10, second). 19. *Gard. Chron.* 834. 1854. Waite's King of the Marrows. 20. *Ibid.* 1. 1857. Monarch, Tall Mammoth. 21. *Florist* 301. 1860. Tall Green Wrinkled Mammoth.

22. *Gard. Chron.* 835. 1856. (As 19, last). 23. *Florist* 301. 1860. Epps' Monarch, Competitor. 24. *Gard. Chron.* 734. 1867. Mote Marrow, Strathmore Hero. 25. *Ibid.* 1017. 1859. Tall Green Mammoth. 25a. Hogg *Gard. Yr. Bk.* 14:109. 1873. Thorpe Perrowe Early Marrow. 26. N. Y. Sta. *Rpt.* 3:245. 1885. King of the Marrows, Green Tall Square Mammoth, Ridé grande vert Mammoth. 27. *Gard. Chron.* 802, 835. 1856. (As 10, fourth, fifth). 28. *Ibid.* 1017. 1859. Fairhead's Excelsior. 29. *Ibid.* 72. 1864. Fairbeard's Forty Fold. 30. *Ibid.* 544. 1871. Popular. 31. *Ibid.* 803. 1875. Commander in Chief. 32. *Rural N. Y.* 62:486. 1903. Kelvedonian. 33. Moore & Simon *Cat.* 1907. Scotch Champion. 34. Kelway *Cat.* 1922. Free Bearer.

NE PLUS ULTRA GROUP

1. Lawson *Agr. Man.* 81. 1834. Magnum Bonum. 2. *Gard. Chron.* 16. 1872. Cullingford's Magnum Bonum. 3. (omitted as erroneous). 4. *Ibid.* 781. 1845. Ne Plus Ultra. 5. *Ibid.* 1017. 1859. Jay's Conqueror, Payne's Conqueror. 6. *Ibid.* 118. 1861. Knight's Ne Plus Ultra. 6a. *Ibid.* 734. 1867. Knight's Albert Edward, Pearce's Gardener's Delight, Gen. Wyndham. 8. Vilmorin-Andrieux *Les Pl. Pot.* 472. 1883. Cullingford's Champion, Champion of the World. 9. *Roy. Hort. Soc. Jour.* 12:37. 1890. Jeyes' Conqueror, Buckley's Gen. Wyndham. 10. Denaiffe *L.P.P.* 187. 1906. Nec Plus Ultra. 11. In Sweden, Non Plus Ultra. 12. *Gard. Chron.* 45. 1859. (As 9, second). 13. *Ibid.* n. ser. 16:210. 1881. (As 5, second). 14. *Ibid.* 834. 1854. Lord Raglan. 15. *Ibid.* 487. 1857. Perfection Marrow. 16. *Ibid.* 70. 1858. Veitch's Perfection. 17. *Ibid.* 694. 1859. (As 37). (As 142). 18. *Ibid.* 172. 1866. Dickson's New Paragon. 19. *Ibid.* 660. 1868. Patterson's Matchless. 20. *Ibid.* 734. 1867. Lord Palmerston? Laxton's Leader? 21. *Ibid.* 1007. 1612. 1872. Laxton's Omega, Omega. 22. *Ibid.* 1692. 1872. G. F. Wilson. 23. *Ibid.* n. ser. 2:732. 1874. Connoisseur. 24. *Ibid.* 166. 1878. Little Wonder, Carter's. 24a. Hogg *Gard. Yr. Bk.* 14:79. 1873. Dixon's Early Dwarf Paragon. 25. *Ibid.* n. ser. 18:581. 1882. Sharpe's Paragon. 26. *Rural N. Y.* 44:496. 1885. Culverwell's Early Paragon. 27. *Ann. Hort.* 124. 1889. Paragon. 28. *Roy. Hort. Soc. Jour.* 37:416. 1911. Paragon, Veitch's. 29. *Gard. Chron.* n. ser. 18:807. 1882. Sutton's Latest of All. 30. *Ibid.* 141. Walker's Perpetual. 31. *Ibid.* n. ser. 20:471. 1883. Walker's Perpetual Bearer. 32.

Ibid. n. ser. 22:341. Watkin's (erroneously) Perpetual. 33. Maule *Cat.* 1894. New Perpetual. 34. *Gard. Chron.* n. ser. 20:202. 1883. Magnificent, Eckford's. 35. *Gard. Chron.* n. ser. 20:649. 1883. Sander's Marrow. 36. *Ibid.* 3rd ser. 2:70. 1887. Autocrat, Veitch's. 37. *Ibid.* n. ser. 28:824. 1886. Anticipation, Carter's. 38. *Ibid.* 3rd ser. 2:618. 1887. Yorkshire Gem. 39. N. Y. Sta. *Rpt.* 6:331. 1888. American Beauty. 40. *Gard. Chron.* 3rd ser. 4:722. 1888. The Don, Quality. 41. *Roy. Hort. Soc. Jour.* 12:29. 1890. Matchless, Sutton's. 42. *Gard. Chron.* 3rd ser. 10:133. 1891. Chelsonian. 43. *Ibid.* 3rd ser. 6:743. 1889. Juno. 44. *Ibid.* 3rd ser. 15:74. 1894. Goldfinder. 45. Buckbee *Cat.* 1894. Grant's Favorite. 46. W. Va. Sta. *Bul.* 39:149. 1895. Gen. Grant. 47. Wood *Cat.* 1895. Acme. 48. Sutton *Cat.* 1895. Late Queen. 49. *Roy. Hort. Soc. Jour.* 25:164. 1900. Capt. Cuttle. 50. Sutton *Cat.* 1898. Continuity. 51. *Gard. Chron.* 3rd ser. 24:99. 1898. Reliance, Hurst's. 52. *Ibid.* 3rd ser. 24:35. 1898. Thomas Laxton; p. 99-Essential. 53. Sutton *Cat.* 1899. Prince of Peas. 54. *Ibid.* *Cat.* 1902. Lord Roberts. 55. Eckford *Cat.* 1906. Censor. 56. *Roy. Hort. Soc. Jour.* 41:289. 1915. Snowdrop. 57. Morse *Cat.* 1922. Early Snowdrop. 58. Sutton *Cat.* 1907. King Edward. 59. Griffith & Turner *Cat.* 1910. Maryland Pride. 60. Carter *Cat.* 1913. Dreadnought. 61. Sutton *Cat.* 1913. Longstander. 62. Routledge *Cat.* 1918. Routledge Prize. 63. Sutton *Cat.* 1920. Alliance. 64. *Roy. Hort. Soc. Jour.* 48:88. 1923. Liberty.

TELEPHONE GROUP

1. *Gard. Chron.* 1544. 1871. Laxton's Superlative. 2. *Ibid.* 708. 1878. Telephone. 3. N. Y. Sta. *Rpt.* 3:246. 1885. Carter's Telephone. 4. Dunning *Cat.* 1908. Dark-podded Telephone. 5. Bolgiano, J. *Cat.* 1911. Improved Telephone. 6. Diggs & Beadle *Cat.* 1923. Improved Dark Green Telephone. 7. Griswold *Cat.* 1923. Allan's Improved Telephone or Admiral Dewey. 8. Wood, Stubbs *Cat.* 1924. Improved Telephone Dark Pod. 9. Aggeler & Musser *Cat.* 1913. Tall Telephone. 10. *Gard. Chron.* 644. 1878. Sharpe's Invincible. 11. Burpee *Cat.* 1886. Invincible Blue Marrow. 12. *Gard. Chron.* 3rd ser. 30:6. 1901. Culverwell's Invincible. 13. *Ibid.* n. ser. 17:141. 1882. Sutton's Invincible Marrowfat. 14. *Ibid.* n. ser. 17:438. 1882. Duke of Albany. 15. *Rev. Hort.* 56. 1888. Duc d'Albany. 16. Dreer *Cat.* 1896. American Champion. 17. Denaiffe *L.P.P.* 1906. Boston Hero. 18. *Rural N. Y.* 43:826. 1884. Queen. 19. Allan *Cat.* 1907. (as 7, second). 20. *Gard. Chron.* 3rd ser. 2:646. 1887. Sharpe's Victory. 21. *Roy. Hort. Soc. Jour.* 43:518. 1918. Victory. 22. Bolgiano, J. *Cat.* 1920. New Victory. 23. *Gard. Chron.* 3rd ser. 1:204. 1887. Abbott's Duchess. 24. *Ibid.* 3rd ser. 2:618. 1887. (23) = (14). 25. *Ibid.* 3rd ser. 5:6. 1889. Duchess, The; Abbott. 26. N. Y. Sta. *Rpt.* 6:331. 1888. (As 16). 27. N. Y. Sta. *Rpt.* 7:135. 1889. Henderson's Midsummer. 28. Lohrmann *Cat.* 1915. Midsummer. 29. *Gard. Chron.* 3rd ser. 10:133. 1891. Alderman. 30. *Ibid.* 3rd ser. 18:423. 1895. Laxton's Alderman. 31. Vaughan *Cat.* 1908. Boston Unrivalled. 32. Currie *Cat.* 1910. (As 19, as 5). 33. N. Y. Sta. *Rpt.* 10:479. 1892. Duke of Edinburgh. 34. *Gard. Chron.* 3rd ser. 9:69. 1891. Colossus. 35. *Ibid.* 3rd ser. 15:124. 1894. Taber's Duke of York. 36. Dreer *Cat.* 1897. Duke of York. 37. *Gard. Chron.* 3rd ser. 12:73. 1892. Empress of India. 38. Sutton *Cat.* 1892. Exhibition Marrowfat. 39. *Gard. Chron.* 3rd ser. 13:157. 1893. Epicure. 40. *Ibid.* 82. 1848. Goliath. 41. McIntosh *Bk. Gard.* 2:56. 1855. Early Goliath (indexed Goliath). 42. *Gard. Chron.* 3rd ser. 15:124. 1894. Goliath. 43. Sutton *Cat.* 1893. Magnum Bonum Marrowfat. 44. *Gard. Chron.* 3rd ser. 18:606. 1895. (As 31). 45. Sutton *Cat.* 1895. Peerless Marrowfat. 46. Moore Seed Co. *Cat.*

1913. British Peerless. 47. Sutton *Cat.* 1896. Prizewinner. 48. Landreth *Cat.* 1896. Phonograph. 49. Mills *Cat.* 1899. Enormous. 50. *Gard. Chron.* 3rd ser. 28:1900. Monarch. 51. S. Dak. Sta. *Bul.* 91:7. 1905. Sharpe's Improved Monarch. 52. Sutton *Cat.* 1899. Sutton's Perpetual. 53. Salzer *Cat.* 1902. Rough Rider. 54. Sutton *Cat.* 1900. Centenary Marrowfat. 55. Eckford *Cat.* 1906. Centenary. 56. *Gard. Chron.* 3rd ser. 30:6. 1901. Sharpe's Standard. 57. Sutton *Cat.* 1901. Masterpiece. 58. Maule *Cat.* 1901. Prodigious. 59. *Ibid.* 1910. Prince Edward. 60. Northrup *Cat.* 1901. Teddy Roosevelt. 61. Ford *Cat.* 1906. (60) = (14, 16). 62. State *Cat.* 1922. Roosevelt. 63. U. S. Dept. Agr., B. P. I. *Bul.* 21:290. 1903. Summer Queen. 64. *Roy. Hort. Soc. Jour.* 29:682. 1905. Exhibition. 65. Vaughan *Cat.* 1908. Vaughan's Best Exhibition. 66. *Gard. Chron.* 3rd ser. 39:139. 1906. Quite Content. 67. Beckert *Cat.* 1922 (as 58, incorrectly). 68. *Roy. Hort. Soc. Jour.* 37:406. 1911. Premier. 69. Sutton *Cat.* 1906. Sutton's Superlative. 70. Darling *Cat.* 1908. Petoskey. 71. *Gard. Chron.* 3rd ser. 51:206. 1912. Harvestman. 72. Moore Seed Co. *Cat.* 1909. Home Garden. 73. Livingston *Cat.* 1909. Golden King. 74. Schultz *Cat.* 1910. Top Notcher. 75. Sutton *Cat.* 1912. Up-to-Date. 76. Dobbie *Cat.* 1912. The Bell. 77. *Roy. Hort. Soc. Jour.* 38:579. 1913. Clipper (wrinkled). 78. Haskell *Cat.* 1913. Haskell's Dark Green Pod. 79. Carter *Cat.* 1913. Market Gardener. 80. Bolgiano, F. W. *Cat.* 1913. Full Crop. 81. Simon *Cat.* 1913. Yankee Prince. 82. Kelway *Cat.* 1915. Good Indeed. 83. Vaughan *Cat.* 1915. Late Gradus. 84. *Roy. Hort. Soc. Jour.* 43:510. 1918. William Richardson. 85. Sutton *Cat.* 1916. Lord Kitchener. 86. L. c. The V. C. 87. *Roy. Hort. Soc. Jour.* 43:517. 1918. Lord Leicester. 88. Jung *Cat.* 1919. Jung's Aristocrat. 89. *Gard. Chron.* 3rd ser. 29:401. 1901. Veitch's Aristocrat. 90. Tait *Cat.* 1918. Longfellow. 91. *Roy. Hort. Soc. Jour.* 43:505. 1918. Plentiful. 92. Sutton *Cat.* 1919. Amateur's Pride. 93. Moore & Simon *Cat.* 1907. Prize-taker. 94. *Roy. Hort. Soc. Jour.* 46:388. 1921. Admiral Beatty. 95. Clibran *Cat.* 1924. Maincrop. 96. Buist *Cats.* Imperator. 97. Kelway *Cat.* 1923. Peacemaker.

SENATOR GROUP

1. *Gard. Chron.* 1199. 1872. Doctor Hogg. 2. L. c. Unique. 2a. *Jour. Hort.* 48:402. 1872. and *Gard. Chron.* 199. 1872. Supplanter. 3. N. Y. Sta. *Rpt.* 4:186. 1886. Bennett's Seedling Market, Bennett's Market. 4. *Gard. Chron.* 26:407, 677. 1886. Laxton's Charmer. 5. Vick *Cat.* 1892. Charmer. 6. *Gard. Chron.* 3rd ser. 18:96. 1895. St. Duthus. 7. *Ibid.*

3rd ser. 4:722. 1888. Shropshire Hero. 8. L. c. Heroine. 9. *Ibid.* 3rd ser. 16:156. 1894. Webb's Senator. 10. Veitch, J. *Cat.* 1913. Senator or Improved Chas. I. 11. Sutton *Cat.* 1894. Eureka. 12. *Ibid.* 1900. Best of All. 13. *Ann. Hort.* 194. 1891. Stanley. 14. *Roy. Hort. Soc. Jour.* 27:207. 1902. Gladstone. 14a. Mich. Sta. *Bul.* 120:24. 1895. Sterling. 15. N. Y. Sta. *Rpt.*

7:136. 1889. Maincrop. 16. *Roy. Hort. Soc. Jour.* 18:clxxvii. 1894. Veitch's Maincrop. 17. *Ibid.* 26:274. 1901. Glory of Devon. 18. *Roy. Hort. Soc. Jour.* 26:273. 1901. Carter's Delicatessse. 19. *Carter Cat.* 1913. Giant Delicatessse, Evergreen. 20. *Sutton Cat.* 1912. Improved Petit Pois. 21. *Rice Cat.* 1915 (?). Rice's No. 13. 22. *Roy. Hort. Soc. Jour.* 36:725. 1910. Rearguard. 23. *Ibid.* 37:417. 1911. President. 24. N. Z. Dept.

Agr. Jour. 2:377. 1911. Star of Australia. 25. *Kelway Cat.* 1912. James Kelway. 26. *Roy. Hort. Soc. Jour.* 43:511, 515. 1918. Union Jack. 27. *Salzer Cat.* 1918. Giant Exhibition. 28. *Unwin Cat.* 1925. Advance Guard, Unwin's. 29. *Roy. Hort. Soc. Jour.* 48:88. 1923. Freedom. 30. *Sutton Cat.* 1922. Phenomenon. 31. *Roy. Hort. Soc. Jour.* 47:84. 1922. John Bull. 32. *De Giogri Cat.* 1924. Chieftain.

EDIBLE-POD, or SUGAR GROUP

1. *Ruellius Nat. Stirp.* 1536. Fresh pods and peas eaten. 2. *Gerarde Herb.* 1045. 1597. Straight podded type sugar peas. 3. *Worldage Syst. Hort.* 197. 1683. Crooked-podded type sugar peas. 4. *Parkinson Par. Ter.* 522. 1629. Sugar, also Pease without skins. 5. *Fuller, Stacy, Blackwell Cat.* 1688. Sugar Pease. 6. *Landreth Cat.* 1824. Eat Pods. 7. *Lawson Agr. Man.* 82. 1836. Sugar, Eatable-pods, Skinless. 8. *Gard. Chron.* 68. 1850. Edible Pod, Sans Parchemin. 9. *Vilmorin-Andrieux Les Pl. Pot.* 459. 1883. Mange-tout, Zucker-Erbsen, Peulen, Digusciotenero, Mangiatullo. 10. *Tait Cats.* Cabbage Peas. 11. *Hort. Reg.* 3:244. 1834. Dwarf Dutch Sugar, Nain Suisse, Dwarf Crooked Sugar. 11a. *Portland Cat.* 1901. Swiss. 12. *Lawson Agr. Man.* 82. 1836. Common Dwarf Crooked Sugar. 13. *Gard. Chron.* 68. 1850. Dwarf Sugar de Grace, Nain hâtif de Hollande, Nain de Hollande. Early May Sugar, Early Dutch, Early Sugar, Nain à la Moelle d'Espagne. 14. *Thompson Gard. Asst.* 322. 1859. Dwarf Dutch. 15. *Burr Fld. Gard. Veg.* 552, 553. 1863. Common Dwarf Sugar, Dwarf Crooked-podded Sugar, Early Dwarf Dutch Sugar, Early Dwarf de Grace. 16. *Vilmorin-Andrieux Les Pl. Pot.* 465. Sans parchemin très nain hâtif à chassiss. (*Vilmorin-Robinson: Very Dwarf Dutch Frame Sugar*), (*Denaiffe, L.P.P.* 192. 1906. Extra Early Very Dwarf Edible-podded). 17. *N. Y. Sta. Rpt.* 2:86. 1884. Dwarf White Sugar. 18. *Denaiffe L.P.P.* 194. 1906. Mangetout nain blanc hâtif. 19. *N. Y. Sta. Rpt.* 3:274. 1885. Dwarf Royal Edible Pod. 20. *Gregory Cat.* 1890. (As 16, last). 21. *Landreth Cat.* 1892. Dwarf White Blossom Sugar. 22. *N. Y. Sta. Rpt.* 3:275. 1885. Very Early Dwarf (Edible-podded), Edible Podded Dwarf, Dwarf Capucin. 23. *Ibid.* 5:248. 1887. Prince Bismarck. 24. *Haage & Schmidt Cat.* 1899. Fürst Bismarck. 25. *Lawson Agr. Man.* 83. 1836. Dutch Dwarf Sugar. 26. *Gard. Chron.* 68. 1850. Sans Parchemin a Demi-ramen. 27. *Vilmorin-Andrieux Les Pl. Pot.* 464. 1883. Sans parchemin nain hâtif breton. 28. *N. Y. Sta. Rpt.* 3:273. 1885. Extra Early Dwarf Brittany (sugar). 29. *Denaiffe L.P.P.* 195, 1906. Tortu nain, À la reine, À la Perle. 30. *Mawe-Abercrombie Univ. Gard. Bot.: Pisum.* 1778. Dwarf Sugar. 31. *Gard. Chron.* 68. 1850. Dwarf Edible Pod, Ledman's Dwarf, Gros nain Sucré, Nain Sucré. 32. *U. S. Pat. Off. Rpt. (Agr.)* 1865. Early English Crooked White Flowered. 33. *Gard. Chron.* 925. 1867. Common Dwarf Sugar. 34. *Vilmorin-Andrieux Les Pl. Pot.* 469. 1883. Sans parchemin nain ordinaire, Mangetout sans rames, Capucin double. 35. *Hort. Reg.* 3:244. 1834. (As 13, fourth), Early May, (as 13, fourth, sixth, eighth). 36. *N. Y. Sta. Rpt.* 3:274. 1885. Dwarf White Edible Podded, (as 17). 37. *Simon-Louis Freres Cat.* 1921. Extra Early Edible Podded, Six Weeks White Sugar. 38. *Vilmorin-Andrieux Les Pl. Pot.* 459. 1883. Sans parchemin de quarante jours. 38. *Denaiffe L.P.P.* 202. 1906. Six Weeks White Sugar. 39. *Benary Cat.* 1921. Forty Days. 40. *Rogers Cat.* 1901. Dwarf Debarbieux. 41. *Hort. Reg.* 3:244. 1834. Tamarind Sugar, New Tamarind. 42. *Gard. Mag.* No. 77. 1836. Tamarind Pea, Late Dwarf Sugar. 43. *Haage & Schmidt Cat.* 1899. Säbel Zucker-Erbsen. 44. *Thorburn Cat.* 1902. Tall White Scimeter (Sugar). 45. *Burpee Cat.* 1915. Giant Sugar Sword. 46. *Dallwig Cat.* 1922. Improved Giant Sword. 47. *Haage & Schmidt Cat.* 1899. Heinrichs frühe. 48. *Gurney Cat.* 1918. Henry's Early Prolific (Sugar). 49. *Benary Cat.* 1921. Heinrich's Earliest. 50. *Landreth Cat.* 1824. Sugar. 51. *Perry & Co. Cat.* 1892. White Sugar. 52. *N. Y. Sta. Rpt.* 3:271. 1885. Large White Edible Podded, Large White Podded Sugar. 53. *Gard. Mag.* No. 77. 1836. (As 9, first), New, (As 50), Broad-sword, Early Spanish. 54. *Gard. Chron.* 68. 1850. Large Crooked Sugar, Six-inch-pod Sugar, Sans parchemin blanc à grandes cosses, Cornes Bélier. 55. *Vilmorin-Andrieux Les Pl. Pot.* 461. 1883. Corne de Bélier, Gourmand blanc à large cosse, Saint-Quentin, Sans parchemin grand à fleur blanche, Geant de Beaulieu, Lyonnais à rames, Sans parchemin de Brauère, Crochu à large cosse. (As 54, first), *Vilmorin-Robinson Veg. Gard.* 529. 1920. Large Crooked, or Scimeter. 56. *Denaiffe L.P.P.* 203. 1906. Tall Half-sugar. 57. *Lawson Agr. Man.* 83. 1836. Late Wyker Sugar. 58. *Gard. Chron.* 68. 1850. Large White Flowering Edible Pod, Late White Sugar, (as 57). 59. *N. Y. Sta. Rpt.* 6:331. 1888. Saint Desirat Melting. 60. *Burpee Cat.* 1893. Mammoth Melting Sugar.

61. *Farmer Cat.* 1914. Tall Melting Sugar. 62. *Bolgiano, J. Cat.* 1923. Edible Podded Mammoth Melting Sugar, Melting Sugar. 63. *Ann. Hort.* 124. 1889. (As 62, second). 63a. *Roy. Hort. Soc. Jour.* 52:114. 1927. Melting Marrow Edible Podded. 64. *Henderson Cat.* 1919. Perfection Sugar. 65. *U. S. Pat. Off. Rpt. (Agr.)* 314. 1856. Tall Skinless, Sans parchemin à rames. 66. *Russell Cat.* 1827. Tall Crooked Sugar. 67. *Hort. Reg.* 3:245. 1834. Tall Sugar, (as 4, first; as 54, first; as 53, fourth), Sans parchemin blanc à grand cosse, Sans parchemin blanc tres long cosse, Late Tall Sugar. 68. *Lawson Agr. Man.* 83. 1836. Tall, or French Imperial (Sugar). 69. *N. Y. Sta. Rpt.* 3:272. 1885. Tall Edible Podded. 70. *Dreer Cat.* 1894. Tall White Sugar. 71. *Thorburn Cat.* 1898. Giant White (Sugar). 72. *Haage & Schmidt Cat.* 1899. Moerheim's Weisse Riessen-Zucker. 73. *Farmer Cat.* 1914. Tall Moerheim Giant White. 74. *Landreth Cat.* 1892. Tall White Blossom Sugar. 75. *Vilmorin-Andrieux Les Pl. Pot.* 469. 1883. Sans parchemin ridé nain, (*Vilmorin-Robinson Veg. Gard.* 541. 1920. Knight's Dwarf Marrow Sugar). 76. *N. Y. Sta. Rpt.* 2:86. 1884. Wrinkled Sugar. 77. *Ibid.* 3:271. 1885. Wrinkled Edible Podded, (as 51). 78. *U. S. Pat. Off. Rpt. (Agr.)* 314. 1856. Tall Wrinkled, Ridé a rames. 79. *Lawson Agr. Man.* 83. 1836. Vilmorins Sugar. 80. *Amer. Hort. Ann.* 136. 1867. Vilmorin's New Wrinkled Edible-podded. 81. *Gard. Chron.* 68. 1850. White-podded Sugar, Sans parchemin à cosse blanc, Yellow Podded Sugar, Sans parchemin à cosse jaune. 82. *Mills Cat.* 1898. Pride of the Garden Golden Sugar. 83. *Vilmorin-Andrieux Les Pl. Pot.* 460. 1883. Beurre. 84. *N. Y. Sta. Rpt.* 3:273. 1885. Edible Podded Butter. 85. *Gregory Cat.* 1890. Tall Butter Sugar. 86. *Benary Cat.* 1900. White Thick Podded Butter. 87. *Haage & Schmidt Cat.* 1899. Dickschottige Butter-Zacker-Erbsen (= Thick-podded Butter). 88. *Roy. Hort. Soc. Jour.* 48:90. 1923. Giant Butter. 89. *Vilmorin-Andrieux, Les Pl. Pot.* 469. 1883. Sans parchemin nain gris. 90. *N. Y. Sta. Rpt.* 3:86. 1885. Dwarf Gray Sugar. 91. *Ann. Hort.* 123. 1889. Dwarf Gray-Seeded Sugar. 92. *N. Y. Sta. Rpt.* 3:274. 1885. Dwarf Gray Edible Podded. 93. *Landreth Cat.* 1892. Dwarf Purple Blossom Sugar. 94. *Livingston Cat.* 1901. Prolific Giant-podded Sugar. 95. *Denaiffe L.P.P.* 194, 200. 1906. Mangetout nain violet à longues cosses, Sans parchemin nain à tres large cosse [à] fleurs violettes, Dwarf Gray-seeded Large-podded Sugar. 96. *Thorburn Cat.* 1892. French Dwarf Sugar. 97. *Sutton Cat.* 1897. French Sugar. 98. *Gard. Mag.* No. 77. 1836. Red-flowered Sugar. 99. *Vilmorin-Andrieux Les Pl. Pot.* 469. 1883. Sans parchemin à fleur rouge. 100. *Burr Fld. Gard. Veg.* 555. 1863. Chocolate. 101. *Vilmorin-Andrieux Les Pl. Pot.* 463. 1883. Geant sans parchemin, Bisalto d'Espagne, D'Alger, Kapuziner, Riesen Kapuziner. 102. *Gard. Chron.* 68. 1850. Giant Eatable Podded. 103. *Burr Fld. Gard. Veg.* 553. 1863. Giant Sugar. 104. *N. Y. Sta. Rpt.* 3:272. 1885. Giant Edible Podded. 104a. *Denaiffe L.P.P.* 212. 1906. Sans parchemin géant à très larges cosses, Caroubi, Caroubier, À la Dame, Giant Very Large-podded Sugar. 105. *Haage & Schmidt Cat.* 1899. Florentiner. 106. *Vilmorin-Robinson, Veg. Gard.* 548. 1906. Giant Florentine, Grosse Graue Florentiner Zucker. 107. *Benary Cat.* 1921. Giant Switzerland. 108. *Roy. Hort. Soc. Jour.* 48:90. 1923. Swiss Giant Sugar. 109. *Landreth Cats.* 1907, 1913. Luscious, Tall Luscious. 110. *Stumpp & Walter Cat.* 1913. Luscious Melting Sugar. 111. *Haage & Schmidt Cat.* 1899. Mammoth Zucker. 111a. *Sonderegger Cat.* 1910. Mammoth German Sugar. 112. *Wood Cat.* 1905. Mammoth Luscious Sugar. 113. *S. Dak. Sta. Bul.* 91:7. 1905. Mammoth-podded Sugar. 114. *Mann Cat.* 1921. Mammoth-pod Sugar. 115. *Burnett Cat.* 1922. Mammoth Gray-seeded Sugar. 116. *Evans Cat.* 1904. Mammoth Field Sugar. 117. *Lawson Agr. Man.* 83. 1836. American Edible Pod Red or Purple. 118. *Lawson Agr. Man.* 83. 1836. Common Tall Crooked Sugar. 119. *Ferry Cat.* 1882. Tall Sugar. 120. *N. Y. Sta. Rpt.* 3:272. 1884. Tall Gray Edible Podded, Tall Gray Sugar. 121. *Landreth Cat.* 1892. Tall Purple Blossom Sugar. 122. *Maule Cat.* 1921 (as 4, first). 123. *Hastings Cat.* 1921. Sugar, or Salad, Edible Podded. 124. *Gard. Chron.* 68. 1850. White Podded Sugar. 125. *Amer. Gard. Mag.* 2:431. 1836. Fishamend's Sugar.

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 Adams, T. Lee, Kansas City, Mo.
 Aggeler & Musser (formerly Johnson & Musser), Los Angeles, Calif.
 Alexander, O. H. (breeder), Charlotte, Vt.

- Alexander Seed Co., Augusta, Ga.
 Alneer Bros., Rockford, Ill.
 Allan, John H., and Allan, J. H., Seed Co., Picton, Canada; Alpena, Mich., and Sheboygan, Wis.
 Allen, Sterling & Lothrop, Portland, Me.
 Anderson, of Hay, Anderson & Sangster, Newington Butts, Eng.
 Angell, C. E., & Co., Oshkosh, Wis.
 Arnold, Chas. (breeder), Paris, Ontario, Canada.
 Baker's, Woolverhampton, Eng.
 Barnard, W. W., Chicago, Ill.
 Barr & Sons., Covent Garden, London, Eng.
 Barr & Sugden, Covent Garden, W. C. London, Eng.
 Bass & Brown, Sudbury, Suffolk, Eng.
 Beckert Seed Store, Pittsburgh, Pa.
 Beckett, Edwin, Aldenham House Gardens, Elstree, Eng.
 Bell & Bieberstedt, Leith, Scotland.
 Benary, Ernst, Erfurt, Ger.
 Bennett, John, Whatcom, Wash.
 Berberry, —, Kenilworth, Eng.
 Bishop, David, New Scone, near Perth, Scotland.
 Bliss, B. K., & Co., New York, N. Y.
 Boddington, Arthur T., & Co., New York, N. Y.
 Bolgiano, F. W., Washington, D. C.
 Bolgiano, J., Baltimore, Md.
 Booth, Wm., Baltimore, Md.
 Breck, Joseph, & Sons, Boston, Mass.
 Brownlees, Wm., Hemel-Hempstead, Eng.
 Brand, Jas., Vancouver, B. C., Canada.
 Bruce, John A., Hamilton, Canada.
 Buckbee, H. W., Rockford, Ill.
 Buist, Robert, Philadelphia, Pa.
 Burbidge, F., Whitfield, near Dover, Eng.
 Burnett Bros., New York, N. Y.
 Burpee, W. Atlee, Philadelphia, Pa.
 Cadwell & Jones, Hartford, Conn.
 California Seed Co., San Francisco, Calif.
 Cannell, H., & Sons, Swanley, Eng.
 Carpenter, Edward, Brighton, Eng.
 Carter, Jas., & Co., London, Eng.
 Charlton, Arthur, & Sons, Tunbridge Wells, Eng.
 Charlwood, Geo., Covent Garden, London, Eng.
 Childs, John Lewis, Floral Park, N. Y.
 Cleveland, A. B., Cape Vincent, N. Y.
 Clibran, W. R., Hale, Altrincham, Eng.
 Condon Bros., Rockford, Ill.
 Cooper, Taber & Co., Witham and London, Eng.
 Cormack & Oliver, New Cross, Covent Garden, London, Eng.
 Cormack, Henry D. (See Cormack & Oliver), London, Eng.
 Cottrell, of Dawe, Cottrell & Benham, London, Eng.
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 Cullen, Messrs. T., Witham, Eng.
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 Daniels Bros., Norwich, Eng.
 Darling & Beahan, and Darling, Lou S. (from about 1917), Petoskey, Mich.
 De Giorgi Bros., Council Bluffs, Iowa.
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 Dicks, Messrs., Manchester, Eng.
 (1) Dickson, Francis & Arthur, & Sons, Chester, Eng.
 (2) Dickson, Alex., & Sons, Belfast, Ireland.
 (3) Dickson, Edmund P., & Son, Hull, Eng.
 Dickson, Brown & Tait, or Dickson & Robinson, Manchester, Eng.
 Diggs & Beadle, Richmond, Va.
 Dillistone, Wm., Sible Hedingham, Essex, Eng.
 Dobbie & Co., Edinburgh, Scot.
 Douglas, John, Washington, D. C.
 Dreer, Henry A., Philadelphia, Pa.
 Dunning & Co., R. B., Bangor, Me.
 Ebbert Seed Co., Rocky Ford, Colo.
 Eckford, Henry, Wem, Eng.
 Elgin Seed Co., Elgin, Ill.
 Elliott, Wm., & Sons, New York, N. Y.
 Elliott Nursery Co., Pittsburg, Pa.
 El Paso Seed Co., El Paso, Tex.
 Epps, W. P., Maidstone, Eng., and Epps & Co., Ringwood, Eng.

- Evans, Edw. J., York, Pa.
 Evans Seed Co., E. E., West Branch, Mich.
 Everitt, J. A., Indianapolis, Ind.
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 Fairbeard, J. F., Sittingbourne, Kent, Eng.
 Fairbeard, Wm. F., Sittingbourne, Kent, Eng.
 Fairhead, Jas., & Son, Hull, Eng.
 Farmer Seed & Nursery Co., Faribault, Minn.
 Farnes, Chas., London, Eng.
 Farquhar, R. & J., Boston, Mass.
 Ferre, Batcheller & Co., Wethersfield, Conn.
 Ferry, D. M., Detroit, Mich.
 Field, Henry, Shenandoah, Iowa.
 Flanagan & Son, London, Eng.
 Forbes Seed Co., formerly J. F. Noll, Newark, N. J.
 Ford, Frank, and Ford Seed Co., Ravenna, O.
 Fuller, Edward; Tracy, Theophilus; and Blackwell, Charles; Seeds-
 men at different London addresses, who issued a joint catalog
 in 1688. This was reprinted, in part, in *Gardeners' Chronicle*,
 24 (3rd ser.) 107. 1898.
 Galloway Bros., Waterloo, Iowa.
 Girling, Samuel, Stowmarket, Eng.
 Goff, Prof. Emmett S., Geneva, N. Y.
 Grand Junction Seed Co., Grand Junction, Colo.
 Gregory, J. J. H., Marblehead, Mass.
 Grenell, W. H., Cape Vincent, N. Y., or Pierrepont Manor, N. Y.
 Grey, Thos. J., Boston, Mass.
 Griffith & Turner, Baltimore, Md.
 Grimstone, Wm., Bloomsbury, W. C., Highgate, London, Eng.
 Griswold, Thos., & Co., South Wethersfield, Conn.
 Griswold Seed & Nursery Co., Lincoln, Nebr.
 Groom, H., Walworth, or Clapham Rise, near London, Eng.
 Gurney Seed Co., Yankton, S. Dak.
 Hairs, Duncan, Charing Cross, London, Eng.
 Haage & Schmidt, Erfurt, Ger.
 Hallowell Seed Co., San Francisco, Calif.
 Harnden Seed Co., Kansas City, Mo.
 Harris, Joseph, Coldwater, N. Y.
 Harrison, (), Romney, Eng.
 Harrison, T., & Sons, Leicester, Eng.
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 Hastings, H. G., & Co., Atlanta, Ga.
 Hawley, R. D., East Hartford, Conn.
 Hay, Anderson & Sangster, Newington Butts, Eng.
 Hay, Sangster & Co., London, Eng.
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 Hill, Messrs., West Cambridge, near Boston, Mass.
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 Hobbies, Ltd., Dereham, Eng.
 Holmes, W. G., Tain, Scot.
 Horsford, F. H. (breeder), Charlotte, Vt.
 Hoskins, Dr. T. H. (breeder), Newport, Vt.
 Hovey, C. M., and Hovey & Co., Boston, Mass.
 Hurst & Son, Chelsea and London, Eng.
 Isbell, S. M., & Co., Jackson, Mich.
 Jackson, Wm., & Co., Bedale, Yorkshire, Eng.
 John, W. O., & Son., Boston, Eng.
 Johnson & Musser (later Aggeler & Musser), Los Angeles, Calif.
 Johnson & Stokes (later Walter P. Stokes, Stokes Seed Farms Co.,
 and Francis C. Stokes), Philadelphia, Pa.
 Johnson Seed Co., and Johnson & Stokes, Philadelphia, Pa.
 Johnson, W. W., & Sons, Boston, Eng.
 Jung, J. W., Randolph, Wis.
 Keeney, N. B., & Son, Leroy, N. Y.
 Kelway & Son, Langport, Eng.
 Kent & Brydon, Darlington, Eng.
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 Knight, Wm., Battle, Eng.
 Landreth—David Landreth (1784–1789); David & Cuthbert Land-
 reth (1790–1829); David Landreth & Co. (1830–1842); David
 Landreth and D. Landreth Munns (1843–1844); David Landreth
 (1845–1859); David Landreth & Son (1860–1874); David Land-
 reth & Sons (1875–1902); D. Landreth Seed Co. (1903–)
 Lawson, Peter, & Son, Edinburgh, Scotland; and Westminster, Eng.
 Laxton, Thos. (breeder and seedsman) and Laxton Bros., Bedford,
 Eng.
 Leonard Seed Co., Chicago, Ill.
 Lilly, Chas. H., and Lilly-Bogardus Seed Co., Seattle, Wash.
 Lincoln, T. H., & Co., Boston, Eng.
 Livingston Seed Co., Columbus, O.
 Lohrmann Seed Co., Detroit, Mich.
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 McCullough's, J. M., Sons Co., Cincinnati, O.
 McKenzie Co., A. E., Brandon, Man., Can.
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 McMillan, H., Kingston-on-Thames, Eng.
 Marlow Seed Co., Atchison, Kans.
 Maule, Wm. Henry, Philadelphia, Pa.
 May, L. L., & Co., St. Paul, Minn.
 Meyer, Stisser Co., Baltimore, Md.
 Michell, Henry F., Philadelphia, Pa.
 Michigan Seed Co., Bay City, Mich.
 Mills, F. B., Rose Hill, N. Y.
 Moore & Simon, Philadelphia, Pa.
 Moore Seed Co., Philadelphia, Pa.
 Morse C. C., & Co., San Francisco, Calif.
 Muzzy Bros., Paterson, N. J.
 Navlet, Chas. A., San Jose, Calif.
 Nebraska Seed Co., Omaha, Nebr.
 Noll, J. F., later Forbes Seed Co., Newark, N. J.
 Northrup, Braslan, Goodwin Co., later Northrup, King & Co.,
 Minneapolis, Minn.
 Nott, Richard (breeder), Burlington, Vt.
 Nutting & Co., London, Eng.
 Paul, A., & Son, Cheshunt, Eng.
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 Porter, Walton Co., Salt Lake City, Utah
 Portland Seed Co., Portland, Ore.
 Poynter, Robert H., Taunton, Eng.
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 Randall-McLoughlin, Seattle, Wash.
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 and Fiske Seed Co.
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 Rice, Jerome B., Seed Co., Cambridge, N. Y.
 Reuter, C., New Orleans, La.
 Rogers Bros. Seed Co., Cape Vincent, N. Y., Sheboygan, Wis., and
 Chicago, Ill.
 Roulledge Seed Co., Portland, Ore.
 Russell, John B., Boston, Mass.
 Salzer, John A., Seed Co., La Crosse, Wis.
 Sander, F., & Co., St. Albans, Eng.
 Schell, Walter S., Harrisburg, Pa.
 Schultz, G. Edward, and Schultz Seed Store, Washington, D. C.
 Shumway, R. H., Rockford, Ill.
 Simon & Son, Philadelphia, Pa.
 Simon-Louis Freres, Bruyeres-le-Chatel, France.
 Sinclair, R., Jr., & Co., and Sinclair & Moore, Baltimore, Md.
 Sonderegger Nursery & Seed House, Beatrice, Neb.
 Squier, Jas. M., & Son, Wellington, later Lindsay, Canada.
 Stark Bros., Louisiana, Mo.
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 Steckler, J., & Co., formerly Richard Frottscher, New Orleans, La.
 Stuart & Mein, London, Eng., and Kelso, Scot.
 Sutton & Sons, Reading, Eng.
 Switzer, Stephen, Westminster, Eng., Cat. 1731 quoted in *Gar-
 deners' Chronicle*, 24 (3rd ser.) 89. 1898.
 Sydenham, Robert, Birmingham, Eng.
 Taber, Geo., with Taber and Cullen, or Cooper, Taber & Co.,
 Rivenhall, Witham, Eng.
 Tait, Geo., & Sons, Norfolk, Va.
 Thorburn, G., and Thorburn, J. M., New York, N. Y.
 Tinsley Seed Co., St. Louis, Mo.
 Thurston, G. & J., Stowmarket, Eng.
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 Unwin, W. J., Histon, Eng.
 Vaughan, J. C., Chicago, Ill. Vaughan Seed Store, Chicago, Ill.,
 and New York, N. Y.
 Veitch, Jas., & Son, Chelsea, Eng.
 Veitch, Robt., & Son, Exeter, Eng.
 Vick, Jas., & Sons, Rochester, N. Y.
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 Ward, S., & Co., Bath, Eng.
 Warner & Warner, later Warner, Seaman & Warner, Cornhill,
 London, Eng.
 Watkins & Simpson, Drury Lane, Covent Garden, London, Eng.
 Webb & Son, Wordsley, Eng.
 Weeber & Son, New York, N. Y.
 Western Seed Co., Denver, Colo.
 Whale, W., Egham, Surrey, Eng.
 Williams Seed Co., Norfolk, Va.
 Wood, Stubbs & Co., Lexington, Ky.
 Wood, T. W., & Sons, Richmond, Va.
 Yates, Samuel, Manchester, Eng.

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N B From this list, to economize space, synonyms are omitted which include name of variety changed in spelling, or with seedsmen's names prefixed, or when preceded by such modifying adjectives as Early, Dwarf, etc. Such synonyms can be readily found from references following the variety name, in text.

A la Reine, of Blue Imperial and of Early Emperor; Abbott, of Duchess; Alameda Sugar or Sweets, of Yorkshire Hero; American Crown, of Rose or Crown; American Dwarf, of Dwarf Marrowfat; Andersonian Mummy, of Grimstone Egyptian; Arnold No. 2, of Bliss Everbearing; Auvergne Green, of Laxton Supreme; Baran or Baron and Bates Early Dwarf Nimble, of Early Frame; Bean, of Egg; Beck's Eclipse, of Blue Scimitar; Beck's Gem and Beck's Marrow, of Tom Thumb; Bellamy Green Marrow, of Prizetaker; Bergere, of Early Emperor; Berkshire Hero, of Tall Green Marrow; Best Early, of Early Frame; Big Gem, of Yorkshire Hero; Black-eyed Susan, of Egg and of Lynn Wrinkled Marrow; Black Spotted, of Spanish Mullato; Bleu, of Blue Prussian; Bleu a courte tige, of Blue Imperial; Blue Alaska, of Alaska; Blue Dwarf and Blue Fan, of Groom Superb; Blue Marrow, of Blue Imperial; Blue Peter, of Tom Thumb, incorrectly; Blue Sabre, of Blue Scimitar; Blue Scymetar, of Blue Imperial; Blue Spanish Dwarf, of Groom Superb; Blue Tom Thumb, of Blue Peter; Blue Union, of Blue Prussian; Branching Victoria, of Branching Marrow; Bresilien, of Prince Albert; Brussels Early Blossom, of Charlton; Buchsbaum, of Tom Thumb; Burlington, of Philadelphia Extra Early; Bush Pea, of Tom Thumb; Cabbage Peas, of Edible Podded; Carpenter's Express, Carter's Earliest, and Carter's Lightning, of Sangster No. 1; Carter's Victoria, of British Queen; Cattell's Kent Rival, of Princess Royal; Cattell's Wonder, of British Queen; Chaud, of Prince Albert; Charlton Hotspur, of Hotspur; Clarke's Rapid Prolific, of Dillistone Early; Clarke's Ringwood, of Tom Thumb; Clematow carre féve, of Black Eyed Marrowfat; Cleveland's First and Best, of Sangster No. 1; Cluster, of Rose or Crown; Clutton's Early, of Prince Albert; Common Hotspur and Common White Boiling, of Charlton; Conqueror, of Early Emperor; Cook's Favorite, of Carter Hundredfold; Cosaque, of Auvergne; Cottrell's Wonder, of Dickson Favorite; Counsellor, of Councilor; Crochu, of Auvergne; Cromwell's May, of True May; d'Avent, of Prince Albert; Dandy, of Sangster No. 1; Dandy Stratagem, of Danby Stratagem; Danecroft Rival, of Emerald Gem, incorrectly; Daniel, of Daniel O'Rourke; Daniel O'Rourke, of Early Frame and of Sangster No. 1; Davis Perfection, of Cannons' Perfection; De Grace, of Tom Thumb; De Marly, of Tall Marrowfat; De Paris, of Early Frame; De Prusse, of Victoria; De Regneville, of Dillistone Early; De Rouelle, of Hotspur; De Sainte-Catherine, of Early Frame and of Early Washington; Delicatess, of Auvergne; Dexter, of Philadelphia Extra Early; Dickson's Climax and Dickson's First and Best Early, of Sangster No. 1; Dickson First and Best, of Caractacus and of Dillistone Early; Dickson's New Paragon, of Veitch Perfection; Dilliston's Early Prolific, of Railway; Doigt de Dame, of Lady Finger; Dominé, of Hotspur; Double Blossomed Frame, syn. of Early Frame; Dunnett's First Early, of Sangster No. 1; Dwarf Albany, of Early Frame; Dwarf Bog and Dwarf Crooked Sugar, of Spanish Dwarf; Dwarf Green Imperial and Dwarf Imperial, of Blue Imperial; Dwarf Prolific, of Dwarf Marrowfat; Dwarf Sabre, of Blue Imperial and of Blue Scimitar; Dwarf Telephone, of Daisy, incorrectly; Dwarf Tewsley, of Dwarf Marrowfat; Dwarf White Prolific and Dwarf White Prussian, of Dwarf Marrowfat; Earliest Double Blossom, of Charlton; Earliest of All, of Ferry First and Best, erroneously; Eat Pods, of Edible Podded; Early Bedalean, of Early Emperor and of Cedo Nulli; Early Burlington, of Landreth Extra Early; Early Caractacus, of Sangster No. 1; Early Charlton, of Hotspur; Early Dillistone, of Dillistone Early;

Early Dutch Green, of Blue Prussian; Early Dwarf, of Early Frame and of Prince Arthur; Early Emperor, of Early Frame; Early Eugene, of Eugenie; Early France Sugar, of Spanish Dwarf; Early French, of Early Frame; Early Green Marrow, of Bellamy Green Marrow; Early Grey Warwick, of Early Warwick; Early Grotto, of Shilling Grotto; Early Hartford, of East Hartford Extra Early; Early Hill, of Hill Extra Early; Early Kent, of Early Frame; Early May, Early Nicholas, Early Nimble and Early One-eyed, of Early Frame; Early Racehorse, of Early Washington; Early Rhenish Marrow, of Dwarf Marrowfat; Early Racehorse, of Early Frame; Early Railway, of Cedo Nulli and of Early Emperor; Early Scone, of Early Frame; Early Sebastopol, of Early Emperor; Early Single Frame, of Charlton; Early Sugar Frame, of Hotspur; Early Tana and Early Warwick, of Early Frame and of Racehorse; Early Washington, Early Waterloo, and Early Wilson, of Early Frame; East Kentish Invicta, of Kentish Invicta; Eastern Shore, of Charlton; Eclair, of Lightning; Emeraude, of Emerald Gem; Emir, of Ameer; Emperor of the Marrows, of British Queen; English Cedo Nulli, of Cedo Nulli; Erin's Queen, of British Queen; Essex and Essex Reading, of Hotspur; Essex Champion, of Early Frame and of Racehorse; Eventail, of Spanish Dwarf; Extra Early, of Prince Albert; Extra Early Dwarf Breton, of Dwarf Brittany; Extra Early Kent, of Dillistone Early; Extra Early Market, of Philadelphia Extra Early; Fairbeard's Conqueror, of Railway; Fairbeard's Early Surprise, of Charlton; Fairbeard's Hardy Early, of Carpenter Express and of Sangster No. 1; Fan, of Spanish Dwarf; Farnes' Earliest May, of Early May; Faucille, of Auvergne; Fine Early, of Early Frame; Fine Long Podded Dwarf, of Blue Prussian; First and Best, of Philadelphia Extra Early; First and Best Early, of Dickson First and Best; First of All, of Daniel O'Rourke; Flack's Imperial, of Carter Surprise; Flack's Victoria or Victory, of Flack Imperial; Flanagan's Early, of Tom Thumb; Florentiner Pfluckerbse, of Early Frame; Florida McNeil, of McNeil; French Canner, of Auvergne; Funnell's Black Spotted, of Egg; Garbutt's Amazon, of Tall Green Marrow; General Grant, of Grant Favorite; General Windham, of British Queen; Giant Marrow and Gibb's Defiance, of Victoria; Glory of England, of Dwarf Marrowfat; Golden Charlton, of Hotspur; Grand Imperial, of Blue Imperial; Green Auvergne, of Laxton Supreme; Green Hastings and Green Nonpareil, of Alaska types (?); Green Prolific, of Prizetaker; Green Prussian, of Blue Prussian; Green Wrinkled Marrow, of Early Green Marrow; Green's Superb Tall Marrow, of British Queen; Gregory's Surprise, of Surprise; Grotto, of Prizetaker; Guinea Dwarf, of Bishop Longpod; Hair's Defiance, of British Queen; Hancock, of Philadelphia Extra Early; Hasting, of Marrowfat; Hastings, of Hotspur; Hatif a la moelle d'Angleterre, of Dwarf Marrowfat; Hatif de Plainpalais, of Prince Albert; Hatif uniflore de Gendbrugge, of Dillistone Early; Henderson's First of All, of Philadelphia Extra Early and of Sangster No. 1; Hooper's Early, or New, Rival, of Sangster No. 1; Hooper's Incomparable, of British Queen; Hots, of Hotspur; Imperial Green Marrow, of Tall Green Marrow; Imperial Wonder, of British Queen; Improved Charles First, of Senator; Improved Early Champion, of Caractacus and of Sangster No. 1; Improved Stratagem, of Giant Podded; Isherwood's Railway, of Sangster No. 1; Joseph, of Emerald Gem; Kent's Early, of Early Kent; L'Eveque, also, misspelled, L'Evergne, of Bishop Dwarf; Late Dwarf, of Charlton; Late Spanish Dwarf, of Dwarf Brittany; Laurant or Laurent, of Early Frame; Le Rapide, of Rapid; Leicester Defiance, of Prizetaker; Lion, of British Lion; Long Island Mammoth, of Telegraph; Lord Palmerston, of Veitch Perfection; Mange-tout, of Edible Podded; Maincrop, of Telegraph; Marquis of Hastings, of Hotspur; Mason's Double Blossomed, of Early Frame; Merveille d'Étampes, of Etampes Wonder; Michaux and Michaux Ordinaire, of Hotspur; Michaux a la Rouelle and Michaux precoce, of Charlton; Mikado, of Green Gem; Morning Star, of Early Emperor and of Maud S; Mountain Telephone, of Telephone; Mummy, of Rose or Crown; Nain Bishop a Longues Cosses, of Bishop Longpod; Nain des Keroulas, of Dwarf Brittany; Nain Gontier, Nain Tres Hatif a Chassis and Nain Hatif Extra, of Tom Thumb; Nain Tres Hatif d'Annonay, of Annonay; Nain vert Bleu and Nain vert Imperial, of Blue Prussian; New Dwarf Norman, of Dwarf Marrowfat; New Dwarf Pea, of Branching Marrow; New Tewsly, of Dwarf Marrowfat; Nimble Taylor, of Hotspur; Nonesuch, of Black Eyed Marrowfat; Nonpareil, of Blue Prussian; Nonsuch, of Woodford Marrow; Nuttings No. 1, of White Gem; Ohio Chief, of Saxonia; Ormond, of Hotspur; Oxonian, of Exonian; Paddington, of Hotspur; Paquette, of Rose or Crown; Patagonian, of Egg; Patterson's Matchless, of Veitch Perfection; Paul's Early Dwarf and Paul's Prolific, of Branching Marrow; Pearl, of Nonsuch; Perfection, of Maud S; Peter, of Blue Peter; Petit Pois, of Auvergne; Petit Pois de Paris, of Hotspur; Peulen, of Edible Podded; Philadelphia Extra Early, of Rural New Yorker; Pierre, of Prince Albert; Plant's Early Dwarf, of Tom Thumb; Plus hâtif, of Early

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BEANS OF NEW YORK

BEING

VOL. 1—PART II

OF

VEGETABLES OF NEW YORK



New York Agricultural Experiment Station
Geneva, N.Y.

Oct. 17, 1934

Dear Madam:

It is a pleasure indeed to have you
sent Vol. I, part 2 of "The Vegetables
of New York", in accordance with your
request.

Very truly yours,

A handwritten signature in dark ink, appearing to read "U. P. Hedrick". The signature is written in a cursive, flowing style with a prominent initial "U".

Director.

STATE OF NEW YORK — EDUCATION DEPARTMENT

THE VEGETABLES OF NEW YORK

BY

U. P. HEDRICK

ASSISTED BY

W. T. TAPLEY

G. P. VAN ESELTINE

W. D. ENZIE

REPORT OF THE
NEW YORK STATE AGRICULTURAL EXPERIMENT STATION
FOR THE YEAR ENDING JUNE 30, 1931

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PREFACE

Under authority from the State, Laws of 1925, the New York State Agricultural Experiment Station is publishing a work entitled *The Vegetables of New York*. The publication is to be issued in three volumes of two or more parts each. Part I of Volume I, *The Peas of New York* was printed in 1928. The publication in hand, *The Beans of New York*, now appears as Part II of Volume I. *The Beans of New York* does not differ in any material respect in aim or scope from the part which has preceded it, to the preface of which the reader is referred for a full statement of the several ends in view in these monographs, the considerations which have governed the selection of varieties and illustrations, and the methods of treating synonyms, references, and classifications.

The statement of authorship which appears on the title page needs a word of explanation. The writer, whose name appears as senior author, has had the planning of the work and the general supervision of it from start to finish. Chapters 1 and 2 on the History and Botany of Beans were written by Professor Van Eseltine. The remaining chapter, containing general notes, a glossary of terms, history, and descriptions of varieties was written by Professor Tapley and Mr. Enzie. Mr. F. H. Hall and Mr. L. R. Hawthorn, former members of the Station staff, whose names appear in *The Peas of New York*, did some work with beans before Professor Tapley and Mr. Enzie came to the Station. Credit should be given to Professor C. B. Sayre, Chief of the Division of Vegetable Crops at this Station, for valuable advice.

June 22, 1931

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U. P. HEDRICK

THE VEGETABLES OF NEW YORK. I

LEGUMES, CUCURBITS, CORN, ALLIUMS, ASPARAGUS

PART II: BEANS

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CHAPTER I

HISTORY OF AMERICAN GARDEN BEANS

The discovery of America very nearly marks the beginning of the recorded history of the common, lima, and runner beans. Of course, beans had been cultivated for untold years in America before 1492, but records are not available or are very scant. Beans, both lima and common, have been found in pre-Columbian Andean tombs and many of the early discoverers report a diversity of kinds that suggests a long period of cultivation not only on the American continental areas but also on the outlying islands. According to Gray and Trumbull (*Am. Jour. Sci.* 26:130. 1883), "Three weeks after his first landing in the new world Columbus saw, near Nuevitas in Cuba, fields planted with '*faxones* and '*fabas* very different from those of Spain' and two days afterward, following the north coast of Cuba, he again found 'land well cultivated with these *fexoes* and '*habas* much unlike ours.' '*Faxones*' or '*fexoes*' were — as Navarrete notes (*Colec.* i, 200, 203) 'the same as *frejoles* or *judias*,' Spanish names for kidney beans, . . ." Oriedo (1525-35) speaks of there being "many kinds in the Indies." Cabeza de Vaca (1528), De Soto (1539), and Jacques Cartier (1534) all mention the beans cultivated by the natives.

The earlier belief in the Asiatic origin of the common bean and its close allies has been so thoroughly disproved that it is thought unnecessary to discuss the question here. The underlying reasons for this belief are noted in De Candolle's *Origin of Cultivated Plants* and their refutation may be found in the works of Gray and Trumbull and of Sturtevant as referred to in succeeding paragraphs.

The earliest reference seen to the cultivation of beans in Europe is by Fuchs (Fuchsius) in his *De Historia Stirpium* (1542) where he figures on p. 428 a bush bean and writes of them as "Welsch Bohnen" foreign beans. Bock, or Tragus, as his name is latinized, pictured the first pole beans in his *De Stirpium* (1552). Following this apparently the spread of these beans was fairly rapid as Dodoens (Dodonaeus) figures pole beans again in his *Fruentorum Leguminum* (1566), as did de l'Obel (Lobelius) in both the *Plantarum seu Stirpium Historia*, p. 511. 1576; and in the *Plantarum seu Stirpium Icones*. 2:260. 1591. De l'Ecluse (Clusius) in 1601 also figured the pole bean and is apparently the first to give an account of the lima bean. He gives a very good description and an unmistakable figure on page ccxxiii of his *Rariorum Plantarum Historia* where he says that he had received the seed from C. V. Purkinje of Posen "late in the year 1576." He also notes having received seeds from Spain as "Guatemalan beans." It is worth noting that he described all forms as "*Phaseoli peregrini*" or "foreign beans." In the 16 kinds mentioned various genera are represented.

What are considered as generic names now were used very loosely at that time and indeed for some years after the time of Clusius. The term legumes now held for members of the bean family was used as broadly as the term "grass" is used occasionally at present — including not only true grasses but also sedges, alfalfa, clover, and other forage plants.

Bauhin in his *Historia Plantarum* (1616) described a large number of beans, pole and bush, common and lima, many of which were reported before 1592. Thus, in the century following the discovery of America, bean culture had begun to spread through Europe with a fair degree of rapidity when account is taken of the poorly developed methods of communication existing at the time. However, Parkinson, in 1629, speaks of them as a rich man's dish, and Worlidge, in 1683, says that "within the memory of man they were a great rarity though now a common, delicate food." As regards the varieties grown Sturtevant notes that Martyn's edition of Miller (1724) lists "varieties of bush beans which can be identified with those grown at the present time, five in all." For detailed notes on the statements of early explorers the reader should consult Sturtevant's *Notes on Edible Plants*, pp. 418-428, 1919, and Gray and Trumbull's review of De Candolle's *Origin of Cultivated Plants* in *Am. Jour. Sci.* 26:130-138. 1883. Unfortunately, these notes are too numerous to be included here.

The year 1753 with the appearance of the *Species Plantarum* of Linnaeus marked the beginning of a period of increased and intensive study of plant life and a valiant effort to clarify the relationships of forms and to organize the almost chaotic mass of knowledge concerning vegetation which had been gradually accumulating during the preceding years. The numerous explorations of the fourteenth and fifteenth centuries had brought into Europe a flood of new plants among which were the ubiquitous and always useful beans. Linnaeus in his work described the common bean as *Phaseolus vulgaris*, the runner bean as *P. coccineus*, and two forms of the lima as *P. lunatus* and *P. inamoenus*. Here we have all the names that enter into most present-day ideas of the major types of American beans, excepting for the moment the Tepary bean, which did not attract attention until the beginning of the twentieth century. The common beans as a group are known as *Phaseolus vulgaris*; the scarlet runner and its various forms are held collectively as *Phaseolus coccineus*; and the lima and its several variant forms are united under *Phaseolus lunatus*.

All of these beans vary to a considerable extent and the numerous extremes of variation have been named by various botanists and indeed the same form has not infrequently received different names from different botanists who were often unaware of the existence of

one another's work. One is inclined at first thought to believe that this is an occasion of "confusion worse confounded," but the condition is not quite so bad as that. A more careful study must be made of variations in order to clarify the application of this plethora of names, but the net result is a clearer appreciation of the factors involved than would otherwise be the case. In tracing out the history of these beans each group must be considered separately.

The common bean.—The common beans during the first 70 years after the publication of Linneaus' *Species Plantarum* apparently received little attention from botanists. Salisbury, in 1796, changed the name to *Phaseolus esculentus* apparently because he did not like the name *vulgaris*; and Zuccarini described in 1809 two forms of the common bean as new species, one of which he attributed to Jussieu.

Between 1821 and 1825 Gaetano Savi, Professor of Botany at Pisa, published in the *Nuovo Giornale de Letterati* a series of notes on the genera *Phaseolus* and *Dolichos* and in the tenth volume (1825) described eight forms of the common bean as distinct species. One of these was considered true *vulgaris*; the remaining seven were new. *P. vulgaris* was divided into three groups, viz., I, seed of a single color; II, seed with bands or broad stripes; and III, seed variegated. Group I was again separated into 14 sub-groups, based largely on the color of the seed; Group II into 10; and Group III into 7. The characters upon which the other seven species were based were drawn largely from the relative dimensions and the appearance of the seeds, although pod characters were taken into consideration.

De Candolle in the *Prodromus* (1825) followed Savi's treatment except for changing the name of one (*P. romanus*) which he called *P. compressus* from the flattened pod and seed, and excepting also the omission of the minor subdivisions of Savi's three groups of *vulgaris*. The segregation of *P. compressus* to include the large-seeded, flatter podded types is of interest as being analogous to the separation of the large flat-podded lima beans from the smaller podded, smaller-seeded forms. It should perhaps be said here that with the increased amount of data on variation now available, neither segregation can be considered valid. While Savi mentioned neither of the species published by Zuccarini, De Candolle places both as synonyms of *P. vulgaris* in the self-colored group.

In 1836, Dr. C. A. Fingerhuth in the tenth volume of *Linnaea* in treating the "Economic Flora of the Lower and Middle Rhineland," added to the list of species names. He used most of Savi's names and added several of his own, as he recognized 13 distinct species. These were assigned to three groups, viz., I, seeds compressed; II, seeds oblong; and III, seeds subrotund. This disposal apparently found little favor with either botanists or horticulturists as his names did not persist.

The next investigation of note was that of George von Martens who, in 1860, published his monograph on *Garden Beans*. In 1869, a revised second edition was

issued. Here he recognized 7 species and 120 varieties. Between the appearances of these two editions of Martens' work Dr. Friedrich Alefeld published his *Landwirthschaftliche Flora* (1886) and placed all the common beans under the single species *Phaseolus vulgaris* with 124 varieties. He stated that all varieties might be classified in three "variety groups" according to height of stem, as 1. *P. vulgaris altus*, 2. *P. vulgaris medius*, and 3. *P. vulgaris nanus* (*P. nanus* L.). However, he followed Martens' system and grouped them according to shape and color of seed into seven variety groups—each equivalent to one of Martens' species.

The foregoing treatments represent the general trend towards a minute classification that extended over a century of botanical work, particularly in Germany, and Alefeld's work in reuniting the numerous varieties under a single species forecasts to some degree the broader conception of a species that later again found favor. It is worth noting that Ascherson and Graebner in their *Mitteleuropaischen Flora* in 1910 reduced the number of varieties to four with two sub-varieties of one of these. This tendency to reunite species and varieties is to be attributed in part to more thorough study of the genetic factors in plants and the realization that none of these numerous varieties is sufficiently constant to warrant a distinctive botanical name. Nearly all the variations as handled by the horticulturist or seedsman are kept fairly true to type by rigorous roguing and careful selection. Each horticultural variety in such a case is really an artifact and must be considered in a separate category from the natural botanical species.

The lima bean.—Linneaus, as has been noted, described two forms of the lima bean as *Phaseolus lunatus* and *P. inamoenus*. The first name is the one accepted. The second name apparently applied to the so called "Speckled Lima." In 1770, Jacquin described another form as *P. rufus*. This is a red-seeded type often known as the Maritius bean. He also described at this time *P. bipunctatus*. This description has puzzled many investigators, though nearly all have referred it to synonymy under *P. lunatus*. The ferruginous spots on each side of the hilum form a character rarely seen in the lima beans, though there is a specimen in the seed collection of the U. S. Department of Agriculture that fits this description; and Jacquin's specimen in the British Museum is *P. lunatus*. In 1787, Medicus described *P. achariensis*. The writer has been unable to consult the original description, but a specimen of Jacquin's so labeled in the British Museum is an undoubted lima of the sieva type.

From time to time following this, various extreme forms were described as distinct species by several investigators, as follows: *P. tunkinensis* Louriero, 1790; *P. macrocarpus* Moench, 1794, based on *P. inamoenus* L.; *P. Xuarezii* Zuccarini, 1809—apparently the first dwarf or bush type; *P. saccharatus* and *P. parviflor* U S Stokes 1812; *P. macrocarpus* Poiret 1813 (the identity of this bean with the lima is questioned, but it seems very likely to be one of the big lima

forms); *P. derasus* Schrank 1819,—a rather common blackseeded form from Brazil; and *P. puberulus* Humboldt, Borysland and Kunth 1823.

In 1825, that portion of the *Prodromus* containing the Leguminosae was published and here De Candolle lists in the same group with the lima, but as distinct species, the following: *P. inamoenus*, *P. tunkinensis*, *P. Xuaresii*, *P. macrocarpus* Poir., *P. derasus*, and *P. puberulus* as well as *P. adenanthus* Meyer. The latter is undoubtedly a distinct species and is now widely distributed throughout the tropics. The others are almost certainly mere forms of *P. lunatus*.

Roxburgh in 1832 added the name *P. maximus* to the already lengthy list of synonyms; and the year 1837 marked a high water mark in the flood of names for this variable species. Blanco in his *Philippine Flora* described *P. ilocanus* and *P. vexillatus*, both of which are apparently lima beans; and Macfadyen in his *Flora of Jamaica* described *P. dumosus*, *P. limensis*, *P. foecundus*, *P. saccharatus*, and *P. latisiliquus*. Only the first of these is questionable and it seems more likely to be a form of the lima than of the kidney bean to which occasionally it has been doubtfully referred.

Bentham in Martius, *Flora Braziliensis* in 1859 attempted a segregation of small-podded and large-podded forms. He considered *P. lunatus* a small-podded form and placed *P. bipunctatus* as a synonym. The large-podded form he called *P. lunatus* var. *macrocarpus* and thought *P. inamoenus*, *P. Xuaresii*, *P. puberulus*, and *P. saccharatus* Macfadyen synonyms.

Bailey in 1923 reviewed the situation in part and feeling that the large- and small-podded forms were distinct species used *P. lunatus* for the small-podded or so-called sieva forms, and *P. limensis* of Macfadyen for the large-podded or big lima types. A careful analysis of the characters proposed as distinguishing these forms has shown that they are invalid with the possible exception of the single one of pod shape. There seems to be as little reason for considering the two forms distinct as there would be in separating pencil-podded and flat-podded types of the common bean; and, in fact, consistency in the treatment of the two groups would demand the recognition of part, if not all of Savi's segregates in the *vulgaris* group, if the extremes of the lima group were considered distinct. The wide variation and large number of intermediate forms of wild or semi-feral types argues very strongly against such a course.

The runner bean.—Apparently the runner bean was the last of the three American beans to be introduced into Europe. Of the early writers—Gesner, Dodonaeus, Clusius, Lobel, and Bauhin—none mention this plant. In 1633, however, Thomas Johnson, on page 1215 of his *History of Plants*—an amended edition of Gerarde's *Herball*, says that the "Scarlet Beane" . . . "was procured by Mr. Tradescant and grows in our Gardens" . . . Thos. Martyn in his edition, 1807, of Miller's *Gardener's Dictionary* says:

In Rays time (1686) it was cultivated rather

for the beauty and durability of the flowers than for the fruit; and ladies did not then disdain to put the flowers in their nosegays and garlands. Mr. Miller seems to have been the first who brought it into much repute as an esculent Kidney-bean; and I well remember his speaking much in praise of it more than fifty years since, and that he preferred it at his own table.

Two years later, the scarlet runner is again described by Cornut in his *Canadensium Plantarum* . . . *Historia*. According to E. Meyer's republication (in the tenth volume of *Linnaea*) of Titius' catalog, it was first noted in Germany in 1654 and three varieties were noted, viz. the black-seeded red-flowered; the variegated-seeded red-flowered; and the white-seeded, white-flowered. Morison mentioned the red-flowered form in 1680, as did Tournefort in 1719. This form is the only one noted in Kniphof's *Centuria* (1747) and in Linnaeus' *Hortus Upsalensis* (1748). Again, in 1753, in the *Species Plantarum* it is the scarlet blossom that gives the valid name to the plant, *Phaseolus coccineus*. One wonders why Linnaeus in the second edition of the *Species Plantarum* in 1763 refers his plant to varietal rank under *P. vulgaris*. Lamarck in his *Encyclopedia* (vol. 3 p. 70), possibly feeling that the name was inadequate, called the runner bean *P. multiflorus* and noted that white-flowered, white-seeded forms occurred. Willdenow in his edition of the *Species Plantarum* adopted Lamarck's treatment; and has been credited very generally and quite as erroneously with having originated this name. De Candolle in the *Prodromus* (1825) held *P. multiflorus* as a composite species with two varieties *coccineus* and *albiflorus*.

Martens in his *Gartenbohnen* made four varieties, viz., *niger*, a black-seeded form; *albus*, the earlier *albiflorus* renamed; *coccineus*, the best known form; and *bicolor* based on *Phaseolus bicolor* of Velloso's *Flora Fluminensis* 1825. This is the "Painted Lady" of the modern catalog. Martens attributes the species to Dom Antonio da Arrabida.

Alefeld in his *Landwirthschaftliche Flora* (1866) made a new genus, *Lipusa*, for the runner bean because of the facts that the cotyledons stay in the ground as in the *Viceae* and the position of the stigma seemed different than in other *Phaseolae*. But one more change in status was made before botanists returned this bean to its original status with its earliest name, *Phaseolus coccineus* of Linnaeus. This change was made by Nicholson in his *Dictionary of Gardening*, vol. 3, p. 94 in 1886, when he called the plant *P. vulgaris* var. *multiflorus*.

Horticultural varieties.—We may consider the horticultural history of the beans as opposed to the botanical history in that the former deals with garden forms or horticultural varieties generally named in the vernacular and representing types selected with special emphasis on characteristics of value in their garden culture or culinary usage. Here earliness or lateness of bearing, type of pod, color of seed, and size and form of vine, pod, and seed are of importance. It is patent to everyone that these differences as discovered and held

by selection and care of individual plants and their progeny would result in groups of plants of uncertain stability. It is nearly impossible to determine now just exactly what kind of plant was meant by the short descriptions and poor illustrations of old horticultural lists, and the likelihood of determining where in our present scheme of classification these old varieties would fall is almost nil — beyond the roughest sort of approximation. Consequently, no attempt is made here to consider horticultural varieties before seedsmen began to list them for sale. Before this the varieties had been passed from hand to hand, exchanged in trade, or otherwise bandied about.

Landreth in 1784 seems to have been America's oldest seedhouse, but many of their early records were lost by fire. Thorburn is noted by several writers as having listed a number of varieties in 1822. Many of these are of fairly certain types and are given here.

Both Large White and Small White limas are listed and undoubtedly represent selections of wild types or at least types cultivated by the Indians and acquired by the early settlers. The bush types came into the trade much later — probably not before 1870–1875. The speckled lima was well known abroad and had been cultivated in the south in colonial times.

Several types of field beans are noted, among which are White Marrow, Yellow Cranberry, China Red Eye, and White Kidney. At that time or within the next decade or two Yellow Eye and Turtle Soup were cataloged. Without question some of these varieties as known today are improved strains of those sold at that time, but the types were apparently fairly true.

Green pole beans were represented by Dutch Caseknife and White Cranberry Pole (Lazy Wife), both of which had undoubtedly been grown by farmers for many years. Red Cranberry Pole evidently was in cultivation here in the early 1800's and London Horticultural is said to have been imported from England in 1825.

Of the green-podded bush types, Long Yellow Six Weeks, Early Yellow Six Weeks, Refugee, and Mohawk were in cultivation among the first and were noted by Thorburn in his early catalogs. Mohawk is said to have been cultivated earlier than 1800 by the Indians. Dwarf Red Cranberry of the same type as Low's Champion was also well known.

In the *Magazine of Horticulture* for 1837 Valentine is noted as a novelty and is one of the first flat-podded beans listed. It was said to have originated near Philadelphia some time before this but apparently was not generally distributed until somewhat later.

About 1835 Cutshort (Corn or Cornhill) appeared in the catalogs and within the next two years the first cultivated wax pole is noted in England as Algiers though it did not find its way into American trade until about 1852 when this variety was introduced as Indian Chief.

The earliest Dwarf Horticultural is said to have been in cultivation before 1845 though present varieties are rather different types from those passing under this name before the Civil War.

The following list cataloged by Horey in 1859 shows the status of bean varieties in the middle of the nineteenth century: Early Round and Early Long Yellow Six Weeks, White's Extra Early, Early Mohawk, Early China, Early Valentine, Dwarf Horticultural, Refugee, White Marrow, Large White Kidney, Half Moon, Turtle Soup, Early White Caseknife, Horticultural Pole, Red Cranberry, Sieva, Large Lima, Scarlet Runner, White Dutch Runner, and Painted Lady Runner.

Within the next 20 years several new varieties appeared, among which the most notable are German Black Wax — probably the first wax-podded bush type in the trade — Golden Wax, Concord, a horticultural pole selection, Dreer's Improved Lima, and Henderson's Bush Lima. The latter, though reported to have been discovered along a roadside in Virginia about 1875, apparently did not get in the trade until 1888.

Selection of promising chance hybrids or sports was apparently the chief source of new varieties in America at this time and indeed for many years later. C. N. Keeney of Leroy, N. Y., who possibly has to his credit as many valuable varieties as any other single grower, is quoted as saying "It is a curious fact that most new varieties of beans are accidents rather than the result of hand pollination. Nature by using bees seems to do a better job of it than man." Keeney started his selections about 1885 and claims, among others, origination of the following better known varieties: Pencil Pod Black Wax, Brittle Wax, Fordhook Favorite, Keeney's Rustless Golden Wax, Wardwell's Kidney Wax, Giant Stringless Green Pod, Surecrop Stringless Wax, Burpee's Stringless White Wax, and Burpee's Stringless Green Pod.

A. N. Jones, also of LeRoy, N. Y., later of Newark, N. Y., produced a larger number of hybrids beginning in 1881 with Jones Ivory Pod Wax, a parent of many later varieties.

D. G. Burlingame of Genesee Co., N. Y., with Bountiful, John Kramer of Doylestown, Pa., with Golden Cluster Wax, and W. H. Grenell of Pierrepont Manor, N. Y., with Grenells Rustless, have selected or originated the varieties listed. Unfortunately, the originators of many varieties are unknown.

Until very lately definitely planned crosses based on studies of the heredity of characters in beans have played so small a part in the development of new varieties that one can not wonder that the discoverer of chance seedlings should have been so quickly forgotten. Moreover, the original discoverer was almost without exception not engaged in the seed business, and he lost both control and interest in the variety as soon as he sold his stock to a large seed company. The commercial concern also lost interest in the introducer as soon as the purchase was completed. The relation of the Burpee Company and Keeney forms a noteworthy exception.

In summarizing, it should be said that with few exceptions all beans coming into the trade during the nineteenth century were types already grown by the Indians and the colonists and were picked up by the

seedsmen from various local sources. Even the more noteworthy selections of the latter part of the century originated from these early local types.

From just before the beginning of the twentieth century importations of varieties originating in Europe (especially through the large seed establishments of Sutton in England and Vilmorin in France) became numerous in American catalogs. Most of these have disappeared because the American custom of using beans at a more mature stage than the Europeans do

has prevented the acceptance of varieties which show stringiness or parchment in the fully formed pods.

Forcing types which were fairly abundant in catalogs of the earlier decades of this period have been rendered unnecessary by the opening up of the large vegetable crop areas of Florida, Texas, and other southern states.

The present tendency is the introduction of strains of fully known parentage.

The history of individual varieties is treated in considerable detail in Chapter III.

CHAPTER II

SYSTEMATIC BOTANY OF BEANS, AND THEIR ALLIES

The beans and their allies as treated in this part of THE VEGETABLES OF NEW YORK form a closely related group of plants known as the tribe Phaseoleae. This group of plants is closely allied to the vetches described in Part I, but differs from them chiefly in their pinnate stipulate leaves without tendrils or setae and in the small disc at the base of the pistils. They are nearly all twining, annual or perennial herbs, though a few are woody and several are not twining.

The tribe contains about 60 genera and over 1,000 species of plants of which only those of commercial importance are discussed. The following chapter, in fact, deals only with certain species of Phaseolus. Other species of this genus, as well as those of several other genera of the tribe, are of sufficient importance to merit some consideration here. Besides those plants more fully described below, the following deserve brief mention: *Amphicarpa monoica* Ell., the "Hog Peanut" of the eastern United States, is said to have been cultivated in the South for its pods (Sturtevant's *Notes on Edible Plants* 47. 1919.), *Apios tuberosa* Moench, the "Ground Nut" of northeastern North America, has edible tubers and is often grown as an ornamental vine. *Voandzeia subterranea* Thouars, the "African Peanut," is grown for its edible seeds. *Pachyrhizus tuberosus* Spreng, the "Yam Bean," has edible pods and roots. *Psophocarpus tetragonolobus* DC., the "Goa Bean," is used in the Old World tropics for its edible seeds and pods. Sturtevant notes that the seeds of certain species of *Clitoria*, *Mucuna*, and *Rhynchosia* are used for food, as are the roots of species of *Flemingia* and *Pueraria* and the leaves of *Erythrina indica* (*Notes on Edible Plants*. 1919).

Tribe: PHASEOLEAE Bronn, *Diss. Legum.* 133. 1822.

KEY TO IMPORTANT GENERA

- A. Style not hairy, except sometimes at the base.
 - b. The 10th stamen (the upper one, opposite to the standard) at least partly united with the others, plants herbaceous.
 - c. Flowers small, not much exceeding the calyx.
 - 1. *Soja* (p. 8)
 - cc. Flowers large, much longer than the calyx.
 - 2. *Canavalia* (p. 8)
 - bb. The 10th stamen free, plant somewhat shrubby.
 - 3. *Cajanus* (p. 9)
- AA. Style hairy.
 - b. Keel merely curved
 - c. Stigma not oblique.....4. *Dolichos* (p. 9)
 - cc. Stigma very oblique.....5. *Vigna* (p. 10)
 - bb. Keel spirally coiled.....6. *Phaseolus* (p. 11)

1. *SOJA* Moench, *Meth.* 153. 1794.

The only species is the following: *Soja max* Piper, *Jour. Am. Soc. Agron.* 6:84. 1914. Soybean. — *Phaseolus max* L. *Sp. Pl.* 725. 1753. *Dolichos*

Soja L. *Sp. Pl.* 727. 1753. *Soja hispida* Moench, *Meth.* 153. 1794. *Phaseolus sordidus* Salisb. *Prod.* 335. 1796. *Glycine Soja* Sieb. & Zucc. *Abh. Akad. Moench.* 42:119. 1845. *Glycine hispida* Maxim. *Bull. Acad. Sci. Petersb.* 18:398. 1873. *Soja Soja* Karst. *Pharm. Med. Bot.* 711. 1882. *Glycine max* Merr. *Int. Rumph. Herb. Amb.* 274. 1917.

Annual herb, stout, bushy, and erect in most of the cultivated forms, but occasionally slender with twining tips — the wild form a slender twining vine — hairy throughout with tawny or gray pubescence, 1–3 m tall; leaves 3-foliate; leaflets entirely ovate, obtuse, mucronate, the lateral oblique, hairy along the veins and margins; flowers small, white or purplish in short axillary racemes; calyx hairy, the upper teeth more or less united; standard broad, slightly auriculate; wings lightly adherent to the short obtuse keel; stamens monadelphous, the 10th partially free; pods short stalked, 5–8 cm long, constricted between the seeds; seeds 2–3 (sometimes 4) globose to oblong, yellow, green, brown, or black, with the small hilum often of different color than the body of the seed. Chromosome No. 10 and 20.¹ Native to eastern Asia.

Soybeans, according to Bretschneider, were cultivated in China as early as 2800 B. C. They can be grown wherever corn is grown, hence New York can probably grow many varieties to advantage. Morse (*Soy Beans, U. S. D. A. Farmer's Bulletin* 1520. 1927) says that "increased utilization of the soybean in the United States has resulted in an enormous increase in acreage for hay, pasturage, silage, and seed." It is estimated that 500,000 acres were grown in the United States in 1917. The acreage had increased to over 3,000,000 by 1927 of which over $\frac{1}{3}$ is used for the production of seed. Wiggins (*Varietal Experiments with Soybeans in New York, Cornell Bulletin* 491. 1929) recommends the following varieties: For all purposes, Black Eyebrow, Minsoy; for seed, Black Eyebrow, Minsoy, Ito San; for hay, Wilson, Dunfield, Hamilton, Black Eyebrow, Minsoy; for silage, Hamilton, Dunfield, Midwest, Black Eyebrow, Minsoy.

It would seem that a sufficient number of varieties tested out in various sections of the State might revise this list considerably and show some sections of the State well adapted for soybean production.

2. *CANAVALLIA* Adans. *Fam. Pl.* 2:325. 1763. (Here spelled *Canavali*; properly latinized by De Candolle in DC. *Prod.* 2:403. 1825.) — *Clementea* Cav. *Anal. Cienc. Nat.* 7:63. 1804. *Malocchia* Savi, *Nuovo Giorn. Pisa* 8:113. 1824. *Wenderothia* Schlecht. *Linnaea* 12:330. 1838. *Cryptophaseolus* O. Kuntze, *Rev. Gen.* 1:176. 1891.

Twining or erect herbs or shrubs; leaves 3-foliate; stipules thin caducous; flowers numerous in axillary raceme-like thyrses; bracts and bracteoles caducous; calyx bilabiate, the upper lip large, 2-lobed, the lower much smaller, simple or (in the following species among others) 3-lobed; standard large, reflexed, auriculate; wings free, narrow, auricled; keel curved, the petals partly united;

¹ The haploid number of chromosomes is given, based on the lists by Tischler, *Tabulae Biologicae* 4:34. 1926, and by L. O. Gaiser, *Genetica* 6 and 12, 1930.

stamens generally monadelphous, the 10th partly (rarely entirely) free; style glabrous; stigma capitate; pods stipitate, oblong or linear, straight or somewhat falcate, ridged near the sutures; seeds globose or ellipsoid, the hilum linear.

About 40 species are known from the tropics and sub-tropics. About two dozen are native to America. Several species are reported to have poisonous seeds. Only two are important as cultivated plants. These are used for food, forage, green manure, etc.

KEY TO CULTIVATED SPECIES OF CANAVALIA

Pod more than 10 times as long as broad; hilum half as long as seed; plant usually bushy 1. *C. ensiformis*
Pod less than 8 times as long as broad; hilum nearly as long as seed; plant climbing 2. *C. gladiata*

1. *Canavalia ensiformis* DC. *Prod.* 2:404. 1825.
Jack Bean.—*Dolichos ensiformis* L. *Sp. Pl.* 725. 1753. *Dolichos acinaciformis* Jacq. *Coll. Bot.* 1:114. 1786. *Dolichos pugioniformis* Gmel. *Syst. Nat. ed.* 13. 2:1105. 1796. *Malocchia ensiformis* Savi, *Nuovo Giorn. Pisa.* 10:21. 1825.

Bushy erect annual, sometimes twining when growing in shade; stems stout, terete, somewhat reflexed, strigillose; petioles usually longer than leaflets; stipules fugaceous; leaflets oval to ovate, 6–12 cm long; flowers rose or light magenta; pods linear slightly curved, beaked at tip, scarcely compressed, 25–30 cm long, 2–2.5 cm wide, 12–20-seeded; seeds ellipsoid, compressed, shiny white, the hilum half as long as seed. Native to Tropical America.

The jack bean is widespread in the tropics of both hemispheres and is cultivated to a small extent in the southeastern United States, but other species of beans seem more profitable for the various uses to which it is put and it seems likely to be useful only under special conditions. A thorough discussion of this bean is given by C. V. Piper in "The Jack Bean." (*U. S. D. A. Circular* 92. 1920.)

2. *Canavalia gladiata* DC. *Prod.* 2:404. 1825.
Sword Bean.—*Dolichos gladiatus* Jacq. *Coll. Bot.* 2:276. 1788. *Canavalia maxima* Thou. *Journ. Bot. Desv.* 1:78. 1813. *Malocchia gladiata* Savi, *Nuovo Giorn. Pisa* 10:24. 1825.

Annual (possibly perennial in the tropics) climbing vine; stems green, reflexed strigillose becoming glabrate with age; petioles shorter than leaflets; stipules fugaceous; leaflets broadly ovate; flowers pale pink or pink tinged; pods linear compressed, slightly curved, 20–35 cm long, 3.5–5 cm broad, 8–16-seeded; seeds ellipsoid, more compressed than those of *C. ensiformis*, the hilum nearly as long as the seed, red or ochraceous, rarely white. Known only from cultivated plants and possibly derived from *C. virosa* (Roxb.) Wight & Arn., a native of India. There are several distinct varieties cultivated in India, Burma, China, Japan, and the southeastern United States. The seeds are said to be very palatable.

The American species of *Canavalia* are treated by Piper in the *Contributions of the U. S. National Herbarium.* 20:555–576, 1925, and the Old World Species were revised by Piper & Dunn in *Kew Bulletin Misc. Inf.* 129–145. 1922.

3. *CAJANUS* Adans. *Fam.* 2:326. 1763. (Here spelled *Cajan* and properly latinized by De Candolle

in *Hort. Bot. Monsp.* 85. 1813.)—*Cajanum* Raf. *Sylva Tellur.* 25. 1838.

Erect shrubs with stout tap root and numerous lateral nodule-bearing, rootlets; branches angular, furrowed; leaflets 3, entire lanceolate; petioles shorter than the leaflets; stipules deltoid subulate, fugaceous; flowers in axillary racemes toward the tips of the branches; calyx with 2 upper lobes united; standard broad, auricled; keel blunt; stamens diadelphous (9 and 1); pod flattish, somewhat constricted between the seeds; seeds usually 3, 4, or 5.

Perhaps two or three species of which the only one well known is the following:

Cajanus cajan Millsp. *Field Columb. Mus. Bot.* 2:53. 1900. Pigeon Pea.—*Cytisus cajan* L. *Sp. Pl.* 739. 1753. *Cajan inodorum* Medic. *Vorl. Ch. Phys. Geo.* 2:363. 1787. *Cajanus flavus* DC. *Cat. Hort. Bot. Monsp.* 86. 1813. *Cajanus indicus* Spreng. *Syst.* 3:248. 1826. *Cajanum thora* Raf. *Sylva Tellur.* 25. 1838. *Cajan cajan* Huth, *Helios* 11:133. 1893.

Erect bushy shrub; branches finely pubescent; leaflets acute, 3–10 cm long, 2.5–3.5 cm wide, grayish tomentose underneath; stipules deltoid subulate; calyx pubescent, the lobes acute; standard orbicular, inflexed at the basal auricles; wings obliquely obovate; style slender thickened in the middle; stigma capitate, oblique; pod 5–8 cm. long, linear, straight or curved, beaked. Probably native to tropical Africa but cultivated and run wild throughout the tropics and subtropics.

Sturtevant (*Notes on Edible Plants* 124. 1919) says "It is certainly one of the oldest cultivated plants in the world . . . Schweinfurth states that it is found in Egyptian tombs of the twelfth dynasty (2200–2400 B.C.)."

The typical form apparently is a pure yellow flowered plant with rather small red seeds. Krauss (*The Pigeon Pea. Hawaii Agr. Exp. Sta. Bull.* No. 46. 6. 1921.) says that "it is early maturing and very heavy seeding, yielding a heavy crop of seeds within 7 or 8 months from time of planting but attaining in the second year a height of only 3 to 7 feet." The following seems to be a well marked form.

C. cajan forma¹ *bicolor* Van Es. comb. nov.—*C. bicolor* DC. *Cat. Hort. Bot. Monsp.* 85. 1813. *C. striatus* Boj. *Hort. Maurit.* 109. 1837. *C. lutens* Bello. *Anal. Soc. Esp. Hist. Nat.* 10:260. 1881.

This form has yellow flowers tinged with red, and light grey, faintly speckled seeds somewhat larger than those of the species. Krauss (l.c.) states that it "does not begin to yield its maximum crop until the second year,—and attains a height of from 6 to 10 feet."

There are apparently several strains of each form in cultivation. The seeds are eaten like peas and are said to be equally palatable; the leaves furnish excellent forage; and the plants are very valuable for enriching the soil.

4. *DOLICHOS* L. *Sp. Pl.* 725. 1753.—*Lablab* Adans. *Fam.* 2:325. 1763 (Latinized as *Lablavia* D. Don, in Sweet, *Brit. Fl. Gard.* II. 3:236. 1834). *Dipogon* Leibm. *Ann. Sci. Nat.* IV. 2:374. 1854.

Twining, trailing or suberect herbs and subshrubs; leaves 3-foliolate, stipellate, the stipules small; flowers axillary, solitary or in close racemes, white, yellow, reddish, or purple; calyx lobes

¹ In the treatment of subdivisions of species in this work the terms *subspecies* and *forma* are used entirely throughout the botanical section. The term *variety* is here used only in the horticultural sense except in the citation of synonyms where such a course is impossible. It is felt that much confusion will be thus avoided.

short, united; standard orbicular, auriculate; wings obovate; keel sharply curved; stamens diadelphous; pod large, flat, beaked; seeds globose or compressed.

There are 60 to 70 species of which only one, the bonavist bean, is cultivated in the United States. This is sometimes held as belonging in a separate genus, *Lablab* or *Lablavia*.

Dolichos Lablab L. *Sp. Pl.* 725. 1753. Bonavist Bean.—*Dolichos purpureus* L. *Sp. Pl.* ed. 2. 1021. 1763. *Dolichos benghalensis* Jacq. *Hort. Vindob.* 2:57. 1772. *Lablab ferrugineus* Medic. *Vorl. Ch. Phys.* 2:354. 1787. *Lablab niger* Medic. 1. c. *Lablab rufus* Medic. 1. c. *Lablab benghalensis* Medic. *Phil. Bot.* 1:205. 1789. *Dolichos martinicensis* Jacq. ex Medic. 1. c. *Dolichos albus* Lour. *Fl. Cochinch.* 2:439. 1790. *Dolichos cultratus* Thunb. *Trans. Linn. Soc.* 2:340. 1794. *Dolichos amoenus* Salisb. *Prod.* 334. 1796. *Dolichos tetraspermus* Willd. *Sp. Pl.* 3:1044. 1800. *Lablab vulgaris* Savi, *Nuovo Giorn. Pisa* 8:116. 1824. *Lablab nankinicus* Savi, 1. c. 119. *Lablab leucocarpus* Savi, 1. c. 120. *Lablab cultratus* DC. *Prod.* 2:402. 1825. *Lablab perennans* DC. 1. c. *Lablab purpureus* Sweet, *Hort. Brit.* 481. 1827. *Lablavia vulgaris* D. Don, in Sweet, *Brit. Fl. Gard.* II. 3:t.236. 1835.

It is an open question as to whether the following apply to this species or to closely allied forms.

Dolichos lignosus L. *Sp. Pl.* 726. 1753.—*Dolichos curtissii* G. Don. *Gen. Syst.* 2:357. 1832.

Annual or perennial (in Tropics) usually viny, climbing from 5 to 30 feet or occasionally bushy; pubescent with short white hairs, or nearly glabrous; leaflets broadly ovate, 7.5 to 15 cm long, abruptly acute; flowers racemose or paniculate, 10 to 30 in each inflorescence, purplish or white, variable in size; pods green, white, purple or purple-margined, fibrous or fleshy, flattened, 4.5 cm to 12 cm long, 1.5 to 3.5 cm wide; seeds nearly globular to compressed ovoid, varying greatly in color, the hilum and raphe prominent. Chromosome No. 11 or 12.

A number of forms have been described but need further study. Among these should be noted those published by Alefeld in his *Landwirtschaftliche Flora*, p. 27 as *Lablab vulgaris* var. *alba*, var. *rubra*, var. *pumila*, and var. *poecila*. A purple-flowered form, the hyacinth bean, is cultivated as an ornamental vine. Numerous forms are cultivated especially in the tropics and sub-tropics. The pods are used as "snap beans," the seeds of some forms are dried, and the plant has had some use for forage and as a green manure. Piper and Morse describe a number of forms in "*The Bonavist, Lablab, or Hyacinth Bean*, (*U. S. D. A. B. P. I. Bulletin* 318. 1915.)

5. *VIGNA* Savi, *Nuovo Giorn. Pisa* 10:27. 1825.—*Plectropis* Schum. & Thonn. *Beskr. Guin. Pl.* 338. 1827. *Callicysthus* Endl. *Prod. Fl. Norf.* 90. 1833. *Scytalis* E. Mey. *Comm. Pl. Afr. Austr.* 144. 1835. *Strophostyles* E. Mey. 1. c. 147. *Liebrechtsia* De Wild. *Ann. Mus. Congo. Bot.* IV. 12:70. 1902.

Twining or erect herbs or subshrubs; leaves 3-foliate, stipulate; flowers usually few, somewhat capitate, often in alternate pairs at the end of long peduncles, white yellowish, pink, reddish, or purplish; standard orbicular, auriculate, callous-ridged within; wings obovate or rhomboid; keel incurved; stamens diadelphous

(9 & 1); ovary sessile; ovules numerous; style bearded inside; stigma oblique, incurved; pods nearly terete, linear; seeds nearly globular to elongate reniform, small. Chromosome No. 11 or 12. Native to the Tropics and sub-tropics.

About 60 species are known. *Vigna* forms a connecting link between *Dolichos* and *Phaseolus*. It differs from the former in having a lateral rather than a terminal stigma and from the latter in having a curved rather than twisted or coiled keel. The important cultivated species is the cowpea, with its variant forms, the catjang and the asparagus bean. They are differentiated as follows:

Pods 8 to 30 cm long, not flabby or inflated; seeds little broader than thick.

Seeds 6 to 9 mm long, pods pendent. . . . 1. *V. sinensis*.

Seeds 5 to 6 mm long, pods erect or somewhat deflexed.

2. *V. sinensis* subsp. *cylindrica*.

Pods 30 to 90 cm long, fleshy, becoming flabby and inflated; seeds elongate reniform, 8–12 mm long, much broader than thick.

3. *V. sinensis* subsp. *sesquipedalis*.

1. *Vigna sinensis* Savi ex Hassk. *Cat. Pl. Hort. Bot. Bog.* 279. 1844. Cowpea.—*Dolichos sinensis* Torner in L. *Cent. Pl.* 2:28. 1756. (*Amoen. Acad.* 4:326. 1759.) *Phaseolus sphaerospermus* L. *Sp. Pl.* ed. 2. 1018. 1763. *Dolichos monachalis* Brot. *Fl. Lusit.* 2:125. 1804. *Dolichos melanophthalmus* DC. *Prod.* 2:400. 1825. *Dolichos oleraceus* Schum. & Thonn. *Beskr. Guin. Pl.* 340. 1827. *Dolichos bicon-tortus* Duri, *Act. Linn. Soc. Bord.* 27:liii. 1869.

Annual prostrate, procumbent, bushy, or erect plants often twining at the tips; stems and leaves pale green to purplish; flowers white or violet; pods more or less torulose or occasionally terete, curved or falcate, rarely straight or coiled, 20 to 30 cm long; pendent, not at all flabby or inflated when green; seeds 6 to 9 mm long, sub-uniform to sub-globose. Native to Central Africa.

The cowpea has been in cultivation since very early times. According to Morse (*Cowpeas: Culture and Varieties*, *U. S. D. A. Farmer's Bulletin* No. 1148. 3. 1920.), the *Phaseolus* of the old Roman writers was the cowpea. He states further that "in Italy the Blackeye cowpea is still called by the same name as the Kidney bean, namely 'fagiolo' which is the Italian equivalent of *Phaseolus*." Romans, in 1775, seems to be the first writer to mention the cowpea in the United States, although there is evidence that it was introduced in the West Indies by the early Spanish landholders and that it was grown in North Carolina as early as 1714. Morse (1. c.) lists about 20 varieties or groups of varieties (including the catjang and asparagus bean) as being grown in this country at present. Piper (*Agricultural Varieties of the Cowpea and Immediately Related Species* *U. S. D. A. B. P. I. Bulletin* 229. 1–160. 1912.) describes 220 cowpeas, 50 catjangs, and 35 asparagus beans. He also gives a full treatment of the botanical history of this group. Reference should also be given here to another paper by Piper (*The Wild Prototype of the Cowpea*. *U. S. D. A. B. P. I. Circ.* 124. pp. 29–32. 1913.) and to one by Wight (*The History of the Cowpea and its Introduction into America* *U. S. D. A. B. P. I. Bulletin* 201. pp. 43–59. 1907.)

Cowpeas are chiefly valuable in the cotton belt. They form the most widely grown leguminous crop in

the South, and though grown largely for forage and green manure, the seeds of most varieties are used for food and furnish an excellent vegetable. They are grown to a slight extent in the warmer parts of New York and probably could be grown to a greater extent with profit. For table use the *Blackeye* and *White* are considered the best varieties. A form of *Blackeye* known as *Extra Early Blackeye* is best adapted to this State. Both *Blackeye* and *White* are group names rather than strict variety names, the first name applying to all forms with white seeds having a black eye and the second to those with creamy white seeds self colored or with a greenish eye. The varieties forming these groups can scarcely be distinguished. Though there seem to be some differences in time of ripening, resistance to disease, etc., the appearance of all is practically identical within the groups. The catjang and asparagus bean groups are more easily distinguished and undoubtedly merit the subspecific rank here assigned them, but extensive field tests with large numbers of types have shown that they can scarcely be considered to merit specific rank. It is quite possible that one or two other types merit subspecific rank with the following forms, but they have not been grown sufficiently long nor widely enough to determine the constancy of their characters.

2. *Vigna sinensis* subsp. *cylindrica* Van Es. comb. nov. Catjang.—*Phaseolus cylindricus* Stickm. *Herb. Amb.* in L. *Amoen. Acad.* 4:132. 1759. *Dolichos catjang* L. *Mant.* 2:269. 1771. *Dolichos lubia* Forsk. *Fl. Aegypt.-Arab.* 133. 1775. *Dolichos transquebaricus* Jacq. *Hort. Vindob.* 3:39. 1776. *Vigna catjang* Walpers, *Linnaea* 13:533. 1839. *Vigna cylindrica* Skeels, *U. S. D. A. Bur. Pl. Ind. Bul.* 282. 32. 1913.

Usually erect or semi-bushy annuals but occasionally trailing; resembling the preceding in foliage and flower characters but differing in fruit and seed; pods small 7.5 to 12.5 cm long, erect when green and usually remaining so when dry or becoming spreading or deflexed at maturity. Under American conditions the best varieties are very late and not prolific.

3. *Vigna sinensis* subsp. *sesquipedalis* Van Es. comb. nov. Asparagus bean.—*V. sinensis* var. *sesquipedalis* Koern. ex Asch. & Schw. *III. Fl. Egypt*, in *Mem. Inst. Egypt* 2:69. 1889. *Dolichos sesquipedalis* L. *Sp. Pl. ed.* 2. 1019. 1763. *Vigna sesquipedalis* Fruwirth, *Anbau Hulsenfr.* 254. 1898.

Trailing, glabrous or glabrate annual vine; leaflets rhomboid; flowers nearly white to violet purple, 2 to 2.5 cm long; calyx lobes acuminate; pods pendent 30 to 90 cm long, fleshy and brittle, becoming flabby and somewhat inflated, shrinking about the seeds when dry; seeds elongate reniform, 8 to 12 mm long, widely separate, color pure buff, clay, blackish violet, maroon, white yellowish or pinkish, or marbled, spotted or speckled.

The Asparagus bean forms an excellent table bean or "snap bean" and certain varieties merit wider culture. They are not equal to the better varieties of cowpeas for seed production and forage.

6. *PHASEOLUS* L. *Sp. Pl.* 723. 1753.—*Cadelium* Medic. *Vorl. Ch. Ges.* 2:352. 1787. *Phasellus* Medic. l. c. *Caracalla* Tod. *Index Sem. Hort. Panorm.* (1861). 32. 1862. *Lipusa* Alef. *Landw. Fl.* 26. 1866.

Mostly herbaceous vines, twining counterclockwise, but occasionally woody and sometimes erect and bushy; pubescence variable; leaves generally long stalked, stipules persistent; leaflets 3, occasionally reduced to 1, entire, variable in shape; stipellate,

nyctitropic by means of swollen articulations at the base of the pedicels; flowers (see fig. 1) yellow, white, red or purplish, axillary in few flowered racemes or spikes; peduncles usually with pedicellate glands; bracteoles (fig. 1.b) always present; calyx (fig. 1.c.) 5 lobed, the upper two lobes often connate; standard (fig. 1.s.) usually more or less orbicular and emarginate; wings (fig. 1.a¹ & a²) oblong to obovate; keel (fig. 1.k) coiled in one or more close turns (except in § *Sigmoidotropis* where it is curled loosely like the letter S); stamens (fig. 1.f.) diadelphous, 9 and 1; pistils (fig. 1.p.) on a short cup shaped disk; the style coiled with the keels bearded within, the stigma oblique or lateral; pods terete or more or less flattened, straight or falcate; seeds few to many, nearly globular to reniform, germination epigeal or hypogeal. Chromosome No. 11 (in the species counted thus far).

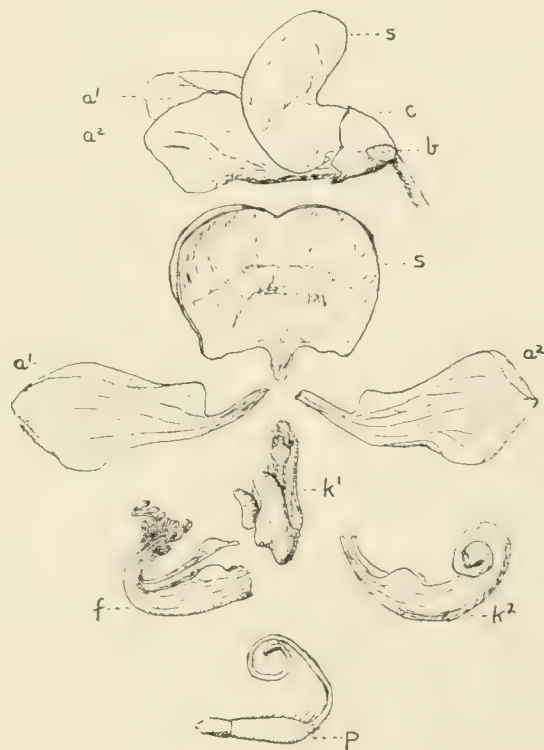


Fig. 1. A flower of the lima bean, King of the Garden, (side view above, and dissected to show parts below) b—bracteole. c—calyx. a¹ and a²—wings or alae. s—standard. k—keel (k¹—with essential organs included; k²—keel alone). f—stamens, showing filament tube and free stamen. p—pistil.

About 100 species in warmer parts of America and perhaps one-third as many in like regions of the Old World. Of these, many are undoubtedly of local importance for food, but only nine are widely cultivated. Three American species, the common bean, the runner bean, and the lima bean are of almost world-wide importance, and the fourth, the tepary bean, is of considerable importance for hot semi-arid regions. These species are treated in more or less detail in the following chapter. The other five are Oriental beans of secondary importance as yet and are treated briefly following the technical description of each species.

KEY TO IMPORTANT SPECIES OF PHASEOLUS

Flowers yellow; left keel petal spurred; oriental annuals.

Leaflets with 3 to 5 narrow deeply cut lobes... 1. *P. aconitifolius*
Leaflets entire or shallowly lobed.

Plants and pods very hairy; seeds mostly dull; germination epigeal.

Branches spreading or procumbent; pods long hairy; seeds oblong, testa not striate, hilum concave. 2. *P. mungo*

Branches erect or ascending; pods short hairy; seeds globose or nearly so; testa crenulate-striate, hilum not concave.

3. *P. aureus*

Plants and pods glabrate or lightly pubescent; seeds smooth and shiny; germination hypogeal.

Racemes 10 to 20 flowered; pods not constricted between the seeds; hilum concave.....4. *P. calcaratus*

Racemes 6 to 12 flowered; pods constricted between the seeds; hilum not concave.....5. *P. angularis*

Flowers white, creamy, red or purplish; left keel petal not spurred; American annuals and perennials.

Roots tuberous or much thickened; flowers numerous, large, showy, scarlet or white on long naked peduncles; germination hypogeal.....6. *P. coccineus*

Roots fibrous; flowers smaller, white creamy, or purplish, (the larger types few on short peduncles), germination epigeal.

Seed without conspicuous radiating lines, nearly circular in cross section; flowers 8 to 20 mm long, on short peduncles.

Bracts small, deciduous; pods generally less than 8 cm long.

7. *P. acutifolius*

Bracts large, persistent, about the length of the calyx; pod generally over 10 cm long.....8. *P. vulgaris*

Seed with conspicuous lines radiating from the hilum, flattened elliptic in cross section; flowers 6 mm or less long, on long peduncles.....9. *P. lunatus*

1. *Phaseolus acutifolius* Jacq. *Obs. Bot.* 3:2. 1768. Moth Bean.

Annual herb forming a mass about .5 m in diameter and $\frac{2}{3}$ as tall; stem short; branches slender, decumbent, not twining; leaflets narrowly 2-5 lobed; flowers yellow, small clustered on the ends of axillary peduncles; pods 2.5-5 cm long, linear, subterete, 5 to 7 seeded; seed linear-oblong, nearly smooth, straw-colored, occasionally marbled with black.

The moth bean is an important crop in India where reports give over half a million acres grown in Bombay and the northern provinces. It does not seem to be able to compete with other leguminous crops in America, however.

2. *Phaseolus mungo* L. *Mant.* 1:101. 1767. Urd Bean.

Low spreading annual with very hairy, usually procumbent, rarely twining branches; stipules with a basal appendage; leaflets more or less rhomboidal; flowers yellow, keel spirally coiled, a hornlike appendage or spur on the side; pods very hairy; seeds oblong, blackish to olive.

The Urd or black gram is also grown in India about as much as the preceding species. It is grown as a green manure in Trinidad and is usually found used as food by the Hindus wherever they have settled. It has not been found equal to other legumes cultivated in the United States and unless new and unique uses are found for the plant it will probably not be used to any great extent in America.

3. *Phaseolus aureus* Roxb. *Fl. Ind.* 3:297. 1832. Mung Bean. *Phaseolus mungo* Auct. non L.

Erect or suberect, pubescent annual 0.3 to 1.2 m tall; branches numerous, sometimes twining at the tips; leaflets ovate, entire or occasionally shallowly trilobate; flowers pale yellow, in clusters of 10 to 25; pods black or brownish, 6.5 to 10 cm long, 10 to 14 seeded; seeds globose or oblong, usually green but occasionally marbled with black, yellow, brown, or madder; seed coat crenulate striate. Native to India.

The mung bean is widely cultivated in southern Asia, parts of Malaysia, and eastern Africa. It has been introduced into China, Japan, Greece, the West Indies, and southeastern United States. Consequently, it has

acquired a large number of local names. It is known as *Green Gram*, *Golden Gram*, *Chiroko* (East Africa), *Bundo* or *Yayenari* (Japan), *Mash* (Arabia), *Lan-ton* (China), *Oregon* or *Chickasaw Pea*, and doubtless numerous other names of more restricted usage. The name *Oregon Pea*, used in the South as early as 1854, arose from a mistaken idea as to its origin. The name *Chickasaw Pea* appeared at least 20 years earlier.

The use of technical names has been quite as varied as that of the common names, due largely to Linneaus' confusion regarding the application of earlier designations and current common names.

In 1753 he apparently assumed that the Arabian "*mash*" applied to the soybean and that Dilleneus' *Phaseolus radiatus* (which was the true mung) applied to a related species which he grew at Upsala. In 1763 he evidently discovered that he had not named the mung and described *Phaseolus mungo*. Unfortunately, this plant was not the common mung of India, but a form of the urd. Roxburgh about 70 years later, while working in India, applied Linneaus' names, assigning *Phaseolus max* and *P. mungo* to forms of the mung and *P. radiatus* to the urd. He also gave a new name, *P. aureus*, to one form of the mung. It is this name which must stand for the mung, while Linneaus' *P. mungo* is the valid name for the urd; the specific name *max* must be held for the soybean; and *P. radiatus* apparently is the proper name for a little-known plant at one time known as *P. sublobatus* of Roxburgh. The untangling of this nomenclatorial web is due largely to the researches of Sir David Prain of Kew and Professor C. V. Piper of the U. S. Department of Agriculture. (See *U. S. D. A. Professional Paper* 119. 1914. *Five Oriental Species of Beans* by C. V. Piper and W. J. Morse.)

According to Piper, "As a field crop the mung is directly comparable to the cowpea and soybean and it has nowhere proved superior to these."

4. *Phaseolus calcaratus* Roxb. *Fl. Ind.* 3:289. 1832. Rice Bean.

Annual herb, with stems 30 to 60 cm high and long twining prostrate branches 1 to 2 m long; leaves resembling those of *P. vulgaris* but the leaflets sometimes shallowly 3-lobed; flowers small, bright yellow; in clusters of 10-20; keel coiled, spurred on left petal; style hairy, prolonged in a narrow terete appendage; 7 to 10 cm long; pods smooth, slender, falcate, straw colored, brownish or blackish; seeds 6 to 10, 5 to 8 mm long, straw colored, greenish, brownish, maroon or black. Native to India.

The following forms have been described by Prain, *Jour. As. Soc. Bengal.* 66:22. 424, 425. 1897:

- (a) *glabra* Prain *l. c.* 424 (*P. glaber* Roxb.) has glabrous stems and leaves.
- (b) *major* Prain *l. c.* 424 has larger flowers.
- (c) *Rumbaiya* Prain *l. c.* 424 has short erect or spreading stems (probably *P. torosus* Roxb.)
- (d) *gracilis* Prain *l. c.* 425 a wild form with slender, smooth stems and narrow leaflets.

The rice bean is cultivated to some extent in eastern and southern Asia, in parts of Malaysia and in Mauritius, but despite the fact that it has been naturalized in Alabama for over 25 years, it seems doubtful that it will compete successfully with the cowpea.

5. *Phaseolus angularis* W. F. Wight, U. S. D. A. B. P. I. *Bulletin* 137. 17. 1909. Adsuki Bean.—*Dolichos angularis* Willd. *Sp. Pl.* 3:1051. 1800.

Bushy summer annual 30 to 50 cm high, leaves 3-foliolate, stipulate; leaflets entire, more or less rhomboidal, the lateral ones oblique; flowers bright yellow in clusters of 6 to 12; keel coiled and spurred on the left side; style hairy, with a flattened terminal appendage; pods 6 to 13 cm long, thin, constricted between the seeds, straw colored, brown or black; seeds 8 to 10, small, straw colored, buff, brown, maroon, or black. Native to eastern Asia.

The Adsuki bean is the most promising of the five oriental beans listed above. It is more nearly comparable to the common or kidney bean in its climatic requirements and hence is more likely to be of value in New York than are the others. It forms the second largest leguminous crop in Japan where the seeds are used as human food as they are in Chosen and to some extent in China and Manchuria. In trials of the Adsuki bean for food they have met the almost unanimous approval of those who tested them. Their seed production, as shown by trials at the U. S. D. A. Experimental Farm at Arlington, Virginia, was exceeded only by the soybean. Numerous varieties are under cultivation in the Orient, of which a maroon-seeded form is perhaps commonest. This form seems to have been the one brought from Japan by the Perry Expedition in 1854 and probably constitutes the first introduction of the Adsuki into the United States.

6. *Phaseolus coccineus* L. *Sp. Pl.* 724. 1753. Runner Bean.—*Phaseolus vulgaris* var. *coccineus* L. *Sp. Pl. ed.* 2. 1016. 1763. *Phaseolus multiflorus* Lam. *Encycl.* 3:70. 1789. *Phaseolus multiflorus coccineus* D. C. *Prod.* 2:392. 1825. *Lipusa multiflora* Alef. *Landw. Fl.* 26. 1866. *Lipusa multiflora* var. *coccinea* Alef. *l.c.* 27. *Phaseolus vulgaris* var. *multiflorus* Nichols. *Dict. Gard.* 3:94. 1886.

Annual (occasionally perennial in the South) twining plant, 3–5 m tall; roots stout; stems slender, puberulent; leaves 3-foliolate, large; leaflets rhombic ovate, acute to acuminate, 8 to 10 cm long; flowers showy, red, white, or variegated, racemes longer than the leaves; pods oblong, spurred at tip, 8–25 cm long; seeds 2 to 3 cm long, 1 to 1.5 cm wide, 0.6 to 0.9 cm thick, white, red, brownish red, brown, purple, or black; germination hypogeal. Probably native to Mexico and Central America.

Besides the typical scarlet-flowered, high climbing form, there are several forms (or cultivars, as Bailey calls them) which have been designated as follows:

(a) *albus* Bailey, *Man. Cult. Pl.* 396. 1924. White Dutch Runner.—*Phaseolus multiflorus* var. *albiflorus* D. C. *Prod.* 2:392. 1825. *Phaseolus multiflorus* var. *albus* Martens *Gartenb.* 82. 1860. *Lipusa multiflora* var. *alba* Alef. *Landw. Fl.* 26. 1866. *Phaseolus coccineus* var. *albiflorus* Bailey *Gent. Herb.* 1:125. 1923.

Flowers white; pods 10 to 12 cm. long; seeds white. Grown primarily for the edible seeds.

(b) *rubronanus* Bailey, *Gent. Herb.* 1:125. 1923.

A bushy form with red or scarlet flowers.

(c) *albonanus* Bailey, *Gent. Herb.* 1:125. 1923.

A bushy form with white flowers which has been advertised as a bush lima.

(d) *bicolor* Van Es. comb. nov. Butterfly Runner.—*Phaseolus bicolor* Vellozo, *Fl. Flum.* 311. 1825. *P. multiflorus* var. *bicolor* Martens *Gartenb.* 84. 1860. *Lipusa multiflora* var. *bicolor* Alef. *Landw. Fl.* 7. 1866.

Flowers red and white; seeds variegated brown and yellow. Used largely as an ornamental.

Two other forms that seem not to merit botanical designation have been separated on the color of the seed. One, a pure black seed form, was noted as *Phaseolus multiflorus niger* by Martens (*l.c.* 82), and the other, with small brownish yellow seeds, as *Lipusa multiflora lucida* Alef. (*l.c.* 27).

All forms of the runner bean produce seeds of high value as food, but the white-seeded forms are usually preferred, while others are grown mostly as ornamentals.

7. *Phaseolus acutifolius* A. Gray, *Pl. Wright.* 1:43. 1852.

Annual twining plant; branches slender, puberulent; leaves 3-foliolate; petioles 3–4 cm long; leaflets lanceolate, 3 to 4.5 cm long; peduncles 2 to 5 flowered, shorter than the leaves; flowers white or purplish; calyx bilabiate, the upper lip scarcely emarginate dentate, the lateral and lower lobes deltoid, acute or acuminate; standard broad, emarginate; wings obovate to spatulate, longer than standard; keel narrow, coiled; stamens diadelphous (9 and 1); pod about 5 cm long, 7–10 seeded; seeds oval, slightly compressed. Native to Southwestern United States and Northern Mexico.

There are two well-marked subspecies (or botanical varieties) differing largely in the shape of the leaves, as follows:

(a) *tenuifolius* A. Gray. *Pl. Wright.* 2:33. 1853.—*Phaseolus tenuifolius* Woot. & Standl. *Contr. U. S. Nat. Herb.* 16:140. 1913. Leaflets linear oblong to elongated linear, petiolules of terminal leaflet 0.8 to 1.2 cm long. Apparently the common form in the western part of the species range.

(b) *latifolius* Freeman, *Ariz. Agr. Exp. Sta. Bull. No.* 68. 589. 1912. Tepary Bean.—*Phaseolus acutifolius* var. (unnamed) A. Gray, *Pl. Wright.* 2:33. 1853.

This is the cultivated tepary of the arid regions of Arizona and Northern Mexico. A very careful and complete description was made by Freeman (*l.c.*) based on a large amount of material. It is here repeated:

"Annual, stems recumbent, spreading or twining, .5–3 m long, glabrous to puberulent. Leaves smooth above with prominent veins beneath, glabrous throughout or slightly puberulent beneath. Stipules lanceolate, 2 mm long, 1 mm broad, striate, appressed. Petioles slender, 2–10 cm long (ave. length 6.8 cm). Leaflets stipellate. Terminal leaflet stalked, large, 4–9.5 cm long (ave. length 6.4 cm), 2, 2–5.2 cm wide (ave. width 3.7 cm) average ratio of length to width 1.74., ovate to broadly lanceolate, at the apex gradually narrowed and acute. Petiolule of terminal leaflets 1.6–3.4 cm (ave. length 2.2 cm) long. The side leaflets are the same general shape as the terminal leaflet but slightly smaller and inequilateral. Length 3.8–7.8 cm (ave. length 5.6 cm) width 2.0–5.0 cm (ave. width 3.3 cm). Inflorescence axillary, leaves superior, peduncles slender, in the upper part bearing 2–5 flowers. Bracts and bractlets small, deciduous. Flowers medium sized, pedicellate, white or pale violet. Calyx short, 3–4 mm long, broadly campanulate, four toothed (the upper two lobes united into one), teeth acuminate, pubescence on teeth and calyx scattered and fragile. Banner broad, emarginate, in flower more than half reflexed, at the base biauriculate, 8–10 mm long. Wings exceeding the banner, obovate to spatulate, 10–15 mm long on one side auriculate. Keel narrow, two or three turns to the spiral. Stamens united in two sets (9 and 1). Legume 2–7 seeded (average 4.9), 5–9 cm long (ave. 7.3 cm), 8–13 mm wide (ave. 10.5 mm) ciliate when young, puberulent, slightly pubescent or smooth when mature, straight or slightly curved. Seed of different varieties white, yellow, brown or bluish black to deep violet, either self-colored or variously flecked. No red seeded varieties have yet been observed. In form the seeds are round-oval to nearly round, as is the Navy bean, to strongly flattened like a diminutive lima."

Freeman found about a dozen varieties that breed true to type and over 30 others, many of which were tested insufficiently to determine the amount of variability. The most important forms were the White Tepary, the Speckled Yellow, and the Brown Speckled. The first has since come into considerable prominence

in the central valley of California and in parts of southern California and is, according to Henry (*California Agr. Exp. Sta. Bulletin* 294. 312. 1918), "The most drought resistant bean grown in California."

8. *Phaseolus vulgaris* L. *Sp. Pl.* 723. 1753. Kidney or Common Bean.—*P. esculentus* Salisb. *Prod.* 335. 1796. *P. lilac* Zucc. in Roem. *Collect.* 148. 1809. *P. nigerrimus* Juss. ex Zucc. *l. c.* *P. compressus* DC. *Prod.* 2. 392. 1825. *P. oblongus* Savi *Nouvo Giorn. Pisa* 10:37. 1825. *P. romanus* Savi *l. c.* 37. *P. saponaceus* Savi *l. c.* 39. *P. tumidus* Savi *l. c.* 39. *P. haematocarpus* Savi *l. c.* 40. *P. sphaericus* Savi *l. c.* 40. *P. gonospermus* Savi *l. c.* 41. *P. mexicanus* Mart. *Hort. Reg. Monac.* 185. 1829. *P. dimidiatus* Haberle ex Schuebl. & Mart. *Fl. Wuert.* 472. 1834. *P. nigricans* Haberle *l. c.* *P. ionocarpus* Fingerh. *Linnaea* 10:8. 1836. *P. amoenus* Fingerh. *l. c.* *P. melanospermus* Fingerh. *l. c.* 8. *P. zebra* Fingerh. *l. c.* 9. *P. triangulus* Fingerh. *l. c.* 12. *P. praecox* Fingerh. *l. c.* 17. *P. subgloboseus* Fingerh. *l. c.* 20. *P. ovalispermus* Fingerh. *l. c.* 21. *P. lupinoides* Fingerh. *l. c.* 24. *P. vexillatus* Blanco *Fl. Filip* 574. 1837. *P. pictus* Cav. ex Steud. *Nom. ed.* 2. 2:317. 1841. *P. angulosus* Schuebl. & Mart. in Mart. *Gartenb.* 47. 1860. *P. asparagoides* Schur. *Enum. Pl. Transs.* 177. 1866. *P. cruentus* Hort. ex Schur. *l. c.* *P. sinensis* Hort. ex Schur. *l. c.*

Erect, bushy to long twining, annual, 0.3 to 5 m tall; stems furrowed, more or less pubescent or puberulent; leaves usually somewhat pubescent on both sides, paler beneath; stipules small, deltoid; leaflets rhombic to deltoid ovate, acute to acuminate, rounded, truncate, or sub-cordate at base; peduncles usually axillary, shorter than the petioles; flowers 1-8, white, yellowish, or purplish; bracteoles ovate, about as long as the calyx; calyx bilabiate, the teeth of the upper lobe obsolete or very short, the lower lobes deltoid ovate; standard sharply reflexed, marginate, with lateral auricles; wings obovate longer than standard; keel strongly coiled; upper stamen with an appendage at the base; pods slender, usually somewhat falcate, the tip sharp and straight and more often recurved; seeds variable but generally terete or bluntly and broadly elliptical in cross-section, often reniform. Native to tropical America.

(a forma *nanus* Van Es. n. comb.—*Phaseolus nanus* Juslen. in *L. Cent. Pl.* 1:23. 1755. *Phaseolus vulgaris* var. *nanus* Aschers, *Fl. Prov. Brand.* 170. 1864. *Phaseolus vulgaris* var. *nonscandens* Bailey, *Gent. Herb.* 1:122. 1923.

Stem often ending in an inflorescence; plants erect, bushy, usually not climbing and not twining. As crosses of pole beans are sometimes dwarf and vice versa one can scarcely give dwarf beans a status higher than that of *forma*.

The name *Phaseolus vulgaris humilis* Alefeld, *Landw. Fl.* 10. 1866 has been used for this form, but Alefeld used the name in a very restricted sense, applying it to one of the 124 "Abarten" which he lists and which are merely Latin names for horticultural varieties, not distinct botanical forms. Alefeld recognized the status of the form *nanus* and gives it in the work cited as a new combination. This was an error, however, as the combination had been made two years earlier by Ascherson.

This form includes numerous horticultural varieties all of which are known as "bush beans" in contrast to the varieties usually known as "pole beans."

Alefeld recognized another form (*medius*), but this seems to be merely a group of the lower forms of pole beans. They have no true characters separating them from the pole beans into which they merge.

Phaseolus vulgaris, as now known, is a very

variable species including about 500 named horticultural varieties. Whether or not this great assemblage of forms arose from a single variable wild species or from a group of closely allied species is a question not likely to be solved satisfactorily from available data. However, the behavior of *Phaseolus acutifolius* may be considered suggestive. Here, a single wild species varying somewhat in leaf shape shows about 100 seed forms in cultivation, many of which breed true to type. This fact might lead one to prefer the idea of the origin of our cultivated forms from a single species not now certainly known in the wild state.

While these forms do not seem to admit of segregation into strict botanical categories, Savi (*Mem. Phas.* 3:1-18. 1826), Martens (*Die Gartenbohnen* 1860), and Alefeld (*Landwirtschaftliche Flora* 1866) divide the kidney beans into a number of what Alefeld calls "Varietaten Gruppen" and "Abarten."

Because of the use that has been made of Martens' classification which was based largely on seed form, it is worth noting here the seven species he recognized with the number of divisions and forms listed. His ultimate divisions, based largely on seed color, correspond nearly to present day horticultural varieties and a fairly well-known variety that, in shape of seed and pod, is representative of each of his species, is therefore added.

- I. *P. vulgaris* Savi (5 div., 34 forms) Turtle Soup.
- II. *P. compressus* Martens (3 div., 18 forms) Dutch Case Knife.
- III. *P. gonospermus* Savi (2 div., 9 forms) Cut Short.
- IV. *P. carinatus* Martens (2 forms) White Lyonnaise.
- V. *P. oblongus* Savi (3 div., 22 forms) Dwarf Mohawk.
- VI. *P. ellipticus* Martens (2 div., 17 forms) Early Yellow Six Weeks.
- VII. *P. sphaericus* Martens (2 div., 18 forms) Indian Chief.

The stem of the kidney bean is strictly annual and the difference in length of node between various sorts of bush beans and of pole beans considered separately is interpreted as being due to two or more genetic factors which, according to Emerson, are non-dominant and independently inherited. However, the distinction between the true pole and the true bush types is considered as being due to a single pair of characters; the indeterminate growth habit of the pole beans being dominant over the determinate habit of the bush beans. The inheritance of growth factors has been treated at length by Emerson (*Nebraska Agr. Exp. Sta. Research Bulletin* 7. 1916) and Norton (*Am. Nat.* 49:547-561. 1915). Norton finds true dwarf types with indeterminate inflorescence and also with very short internodes.

The bean plant develops a strong tap root usually penetrating the soil for 2 feet or more. There are numerous laterals with a spread of 4 or 5 feet and filamentous roots penetrating the soil to a depth of 5 feet or more under favorable circumstances. However, it seems that the great bulk of feeding roots are in the top foot of soil and spread 2 to 2½ feet on every side of the stem. The behavior of Wardwell's Kidney Wax bean has been investigated thoroughly by Weaver

and Bruner (*Root Development of Vegetable Crops* 184 ff. 1927). The strain of nitrogen-fixing bacteria on bean roots seems to be specific for *Phaseolus*.

The leaves vary in color from light green to dark green in different varieties and there seems to be some correlation between depth of seed coat color and darkness of leaves.

The flowers are showy, white, purplish, or yellowish and are borne in closely aggregated clusters on the ends of short peduncles. The inflorescences of the pole beans appear continually during the season, due to the indeterminate habit of the stem, and flowers and fruits in all stages of development may be found on a plant at the same time. On the bush beans, however, due to the determinate growth of the stem, the flowers appear almost simultaneously and the fruits mature together. The corolla is of the typical "butterfly" type. The upper petal or standard is large and bends sharply backward. The lateral petals or wings extend forward and are considerably longer than the standard. The two lower petals form the keel which in this genus is spirally coiled at the tip. The stamens and style are included within the keel and the end of the style is coiled in the same manner as the tip of the keel.

Due to this peculiar infolding and coiling of the lower petals, the flower presents considerable hindrance to cross-pollination by insects, though bees and some other insects do succeed in pollinating a small proportion of bean flowers. Emerson (l. c.) found from 0 to 10 per cent of crossing in lines with which he was working and Kristofferson (*Hereditas* 2:395-400. 1921) found 0.19 per cent in green-shelled varieties, 0.8 per cent in snap beans, and 1.42 per cent in dry field beans. Many varieties showed no crosses. Self pollination occurs readily. Pollen grains may begin to germinate 4 or 5 hours before pollination actually occurs, according to Weinstein (*Am. Jour. Bot.* 13:248. 1926), and the tube enters the micropyle of the ovule within 8 or 9 hours after pollination. The chromosome number of the varieties thus far examined is $n=11$.

The inheritance of color in the bean flower has been studied by Shaw (*Massachusetts Agr. Exp. Sta. Bulletin* 25 1-24. 1913.) and three types of color, carmine red, rose, and white differentiated. Rose and light rose seem to behave alike, but there may be two factors involved in white. Pending further investigations, however, it may be said that of the colors given carmine red is dominant over either of the others and rose is dominant over white, both apparently in a straight 3:1 ratio.

The fruit of beans is a typical legume, a pod with a single cavity opening along both dorsal and ventral

sutures when dry. Unlike peas, the calyx is not persistent, though the base of the style forms a sharp tip to the pod. Various pod characters have been studied genetically. Green color is dominant over yellow in the unripe pod in straight Mendelian ratio ⁽¹⁾; round shape is likewise dominant over flat ⁽²⁾; blunt apex over sharp ⁽³⁾; non-constricted over constricted ⁽⁴⁾; threshable over non-threshable ⁽⁵⁾; irregular segregation was found in the results of crossing broad-podded forms and narrow-podded ones ⁽⁶⁾, and long-podded and short-podded forms ⁽⁷⁾, though parchmented forms were found to be purely recessive when crossed with non-parchmented types.

The seeds are borne alternately on the two placentae bordering the ventral suture. There is a wide variation in color, size, and shape of the seeds; and although there have been numerous genetic studies of the factors involved, the results are so complicated as to render attempts at generalizations useless. This study is further complicated by the fact that the shade of color of the seed coats is liable to change in storage.

Selection of improved types has been the type of breeding work of most practical value thus far. Johannsen (*Über Erbllichkeit in populationem und in reinen Linien* Jena, 1903) has shown that pure lines are very generally stable and mutations occur very rarely.

Beans are subject to several diseases in this State, blight (*Bacterium phaseoli*), wilt (*B. flaccumfaciens*), anthracnose (*Colletotrichum lindemuthianum*), rust (*Uromyces appendiculatus*), root rot (*Fusarium* spp.), and mosaic being the chief maladies. The bean weevil and the Mexican bean beetle are the chief insect pests.

9. *Phaseolus lunatus* L. *Sp. Pl.* 724. 1753. Lima Bean.—*P. inamoenus* L. *Sp. Pl.* 724. 1753. *P. rufus* Jacq. *Hort. Vindob.* 1:13. 1770. *P. bipunctatus* Jacq. *l. c.* 144. *P. tunkinensis* Lour. *Fl. Cochinch.* 435. 1790. *P. macrocarpus* Moench. *Meth.* 155. 1794. *P. Xuarezii* Zucc. in Roem. *Collect.* 4:149. 1809. *P. saccharatus* Stokes *Bot. Mat. Med.* 4:16. 1812. *P. parviflorus* Stokes *l. c.* 4:18. 1812. *P. macrocarpus* Poir. *Encycl. Suppl.* 3:6. 1813. *P. derasus* Schrank, *Pl. Rar. Hort. Monac.* 89. 1819. *P. puberulus* H. B. K. *Nov. Gen. & Sp.* 6:451. 1823. *P. maximus* Roxb. *Fl. Ind.* 3:288. 1832. *P. ilocanus* Blanco *Fl. Filip* 572. 1837. *P. vexillatus* Blanco *l. c.* 274. *P. dumosus* Macf. *Fl. Jam.* 1. 279. 1837. *P. limensis* Macf. *l. c.* *P. foecundus* Macf. *l. c.* 281. *P. latisiliquus* Macf. *l. c.* 282. *P. saccharatus* Macf. *l. c.* 282. *P. platyspermus* Haberle in Steud. *Nom. ed.* 2. 2: 17. 1841.

⁽¹⁾ Emerson, *Mass. Agr. Exp. Sta. Bulletin* 25 1-24. 1913; Lock, *Ann. Roy. Bot. Gard.* 3:95ff. 1906; and Tschermak, *Zeits. Pflanz. Zucht.* 4:65ff. 1916.

⁽²⁾ Tschermak, *l. c.*

⁽³⁾ Tschermak, *l. c.* and *Zeits. Abst. u. Vererb.* 28:28ff. 1922.

⁽⁴⁾ Tjebbes & Kooiman, *Genetica* 4:447ff. 1922.

⁽⁵⁾ Emerson *l. c.*

⁽⁶⁾ Tschermak *l. c.*

⁽⁷⁾ Emerson (*l. c.*); Tschermak (*l. c.*); and Wellensick, *Genetica* 4:443ff. 1922.

P. lunatus var. *macrocarpus* Benth. in Mart. *Fl. Bras.* 15:181. 1862. *P. amazonicus* Benth. *l. c.*

Climbing or erect, pubescent or glabrate; leaves 3-foliolate, leaflets ovate or rhomboid, acute, entire, 5 to 14 cm long, dull green above, paler beneath; stipules small, deltoid; flowers numerous, small, greenish yellow or white, in racemes at the end of peduncles as long or longer than the petioles; calyx bracts linear to oval; calyx broadly campanulate with broad deltoid lobes; pods 5 to 12 cm long, 2 to 2.5 cm wide, the margin variously thin to very thick, the beak sharp and slender to stout and blunt; seeds flat and thinnish, or thick oval, 1.0 to 2.0 cm long with more or less conspicuous lines radiating from the hilum. Native to tropical America, but widely grown throughout the world and firmly established in many places.

There are three outstanding groups in cultivation in America, viz., the so-called Big Limas, the Potato Limas, and the Sieva or Small Lima beans. All variations between these types seem to exist in wild plants from Central and South America and indeed, many of these varieties have found their way into Africa and the far East. Under such conditions it seems inadvisable to treat the cultivated segregates as distinct botanical subspecies, though it may be well to include them as forms in order to have ready reference to the variations listed in various publications. For a more detailed discussion of these forms, the reader is referred to "*Variation in the Lima Bean, Phaseolus lunatus, as illustrated by its synonymy.*" *New York State Agr. Exp. Station Technical Bulletin* 182. 1931.

The following forms have been distinguished:

(a) forma *macrocarpus* Van Es.

This is the big lima type often listed as var. *macrocarpus* Benth. or as *P. limensis* Macf.

(b) forma *salicis* Van Es.

This form is the willow leaved type described as *Phaseolus lunatus* var. *salicis* Bailey *Gent. Herb.* 1:123. 1923.

(c) forma *lunonanus* Van Es.

The dwarf bush Sieva type was described as *Phaseolus lunatus* var. *lunonanus* by Bailey *l. c.*

(d) forma *limenanus* Van Es.

The bush or dwarf form of the big lima was described as *Phaseolus limensis* var. *limenanus* by Bailey *l. c.* 125.

(e) forma *solanoides* Van Es.

The so-called potato type differs from other forms in the more triangular leaflets and the more nearly spheroidal seeds.

Since neither flower characters nor those of the fruit and leaf can be used to separate the material grown outside the United States, it is thought best for the purpose of this volume to hold all forms under the specific name *Phaseolus lunatus* and to leave the subdivisions of the group to the ordinary horticultural practice as given in the succeeding chapters. In this connection the opinion of that careful student of the legumes, C. V. Piper, should be quoted. After years of work with the entire group, he says, "This is a very diverse aggregation of both wild and cultivated forms whose status is variously interpreted by different botanists. In the writer's judgment it is but a single botanical species." (*Studies in American Phaseolineae, Contr. U. S. N. H.* 22:694. 1926.)

The American horticultural varieties are all of comparatively recent development and the selection work of Shaw (*California Agr. Exp. Sta. Bulletin* 238. 1913.) seems to show that a fruitful field in breeding awaits the experimenter in this group.

Two diseases, downy mildew (*Phytophthora phaseoli*) and pod blight (*Diaporthe phaseolorum*) are reported as specific to this crop. Bacterial spot (*Bacterium vignae*) also is reported to attack both pods and leaves.

CHAPTER III

DESCRIPTIONS OF VARIETIES

GENERAL NOTES

The descriptions and histories of bean varieties which follow are arranged into six classes, viz., Pole Garden Beans, Bush Garden Beans, Field Beans, Horticultural Beans, Lima Beans, and Runner Beans. The trials on which the descriptions are based were started at Geneva in 1922, the test plat having some 400 varieties and strains that year. In addition to this, rather complete trials were conducted during the years 1923, 1927, and 1930. Records were also available of the early trials of garden beans as conducted in 1882 and 1883 by Prof. Henry H. Wing. These early records contained much valuable material descriptive of the varieties in common usage at that time as well as offering comparison with descriptions of the same varieties grown at the present time. In addition to the early work of Wing, there were also available the very excellent monographs on beans by Irish, 1901; Tracy, 1903; and Jarvis, 1908, as well as the earlier publications on lima beans by Bailey, 1895-96. These earlier works furnished the basis for the list of varieties to be grown and were naturally a source of information to use in checking the records as found during the recent trials. Recourse to old catalogs was made to complete the list of variety names and the current issues carefully checked for the newer introductions. Seed of the better known varieties was secured direct from the large wholesale growers of bean seed in order to have as dependable material as possible in describing the standard sorts. A large number of variety names were found in only a few catalogs, seed of which was secured direct from the company which offered the seed for sale.

The trial grounds of W. Atlee Burpee Co. at Doylestown, Pa.; D. Landreth Seed Co., Bristol, Pa.; J. B. Rice Seed Co., Cambridge, N. Y.; Ferry Morse Seed Co., Detroit, Mich.; and the U. S. Department of Agriculture, Washington, D. C., were visited by one or more of the authors in order to see as many varieties as possible growing under similar conditions and the same varieties in different environments. The above-named institutions, together with the following, have freely supplied seed stock during the trial period: The Associated Seed Growers, Inc., New Haven, Conn.; S. D. Woodruff & Sons, Orange, Conn.; Rogers Bros. Seed Co., Chicago, Ill.; Alfred J. Brown Seed Co., Grand Rapids, Mich.; Washburn-Wilson Seed Co., Moscow, Idaho; and many others.

In order to compile the material pertaining to the histories of the varieties, it has been necessary to seek information from a large number of individuals. This information has been freely forthcoming and has greatly facilitated the gathering together of the facts concerning the originators and the introducers of many of our earlier varieties. Without this patient cooperation it is certain that much of the material presented here would have

remained unearthed. The authors extend sincere thanks to individuals in the firms above mentioned, to many other individuals of the seed trade, and to co-workers at other institutions whose names remain unmentioned because of lack of space.

As stated in the preface this work was under the direct charge of F. H. Hall from its inception continuously up to the time of his death in 1929. Associated with him in the carrying out of the project was Leslie R. Hawthorn, since January 1931 of the Texas Station. The authors have attempted to carry the work to its completion and to organize and to write up the material with as few errors as possible. However, since errors undoubtedly exist, the writers will be most grateful for any suggestions that may be forthcoming.

The photographs for the five colored plates of seeds were taken in October 1925, all others were taken during the summer of 1923. These illustrations are used as originally made with the variety names as they appear on the original plates. They serve to illustrate the widely divergent pod types and characteristics as well as to indicate, especially in the seed, the range of variation that occurs within a variety.

For recording the characteristics of the varieties grown, check sheets were used, each characteristic being so sub-divided that a simple check mark made the record. In this connection it may be well to point out the difficulty in recording separatory characters on a large number of varieties any one season. The edible beans come on very rapidly and data on many characters must be taken within a narrow spread of time. In collecting the data and in preparing it for publication, technical terms have been avoided as far as possible and the description written for the practical grower and seedsman. The attempt has been made to standardize the descriptive writing so that the data are given in the same order for each variety. A glossary of terms used is given below.

The choosing of the correct name to use for each variety has been given careful consideration. Wherever possible the principles applied in "Standardized Plant Names" have been used, but inasmuch as names of varieties of vegetables are not listed in that work it has been necessary for the authors to decide upon the names without recourse to a standard guide. In the great majority of cases the names now in common usage remain unchanged. Many names have been shortened in the interest of simplicity and "to make merchandising and buying easier." Where the recorded data have shown reasonably sure evidence of "identity" between two or more varieties, the authors have tried to preserve the name which seemed to offer the strongest case for its maintenance and listed the others as synonyms.

It is here that our judgment will be subject to argument and further trials will be necessary to settle the contended point. It is our belief that within the thousand or more variety names of beans there is particular chaos of name duplication and, what is more evident, an all too free use of descriptive adjectives that have little true meaning when the varieties are brought together in comparative trials.

In a publication of this type in which an attempt has been made to write an account of all varieties, not only in New York, as the title would indicate, but those of North America as well, it would neither be possible nor appropriate to attempt a specific classification and key to the varieties used. At best, it would fail to do justice to many of the varieties classified under certain groups, inasmuch as they would have been grown under unfavorable conditions. It is evident, therefore, that because of size, and perhaps color changes that might be incurred, some varieties would be classified improperly. As several attempts have been made at classifying this crop and since it is almost impossible to develop one adaptable to all sections that would be a distinct contribution, it has been considered best to discuss briefly each of the present classifications and keys and to refer the reader to the originals for further use.

It was not until 1860 that the first attempt was made to write a monograph on *Phaseolus vulgaris*. At that time George Von Martens published his book, *Die Gartenbohnen*. He separated the varieties of the common garden beans into seven species. *Phaseolus lunatus* and *P. coccineus* (*P. multiflorus*) were also listed. These were sub-divided again according to the color and shape of the seed, together with a designation of plant type as either dwarf or climbing, to act as an additional separating feature of varieties.

The next attempt of this type was made in 1892-93 by Henry H. Wing, at that time Assistant Director of the New York Agricultural Experiment Station at Geneva. He followed to some extent the same horticultural classification as did Von Martens, i. e., the color and shape of the mature seeds and the presence or absence of the dwarf and climbing habit. In addition, however, he added color of edible pod, inserting this characteristic in the same heading with color of the seed. He apparently thought of including leaf characters as an index in separating varieties, but later suggested that, although considerable variation existed in size, shape, and color of leaves among varieties, such differences occurred almost as frequently on the same or separate plants of the same variety.

Wing used what might be termed a combination key. The first portion was purely technical, based entirely upon abstract terms, and used to designate the type rather than the complete list of varieties that would come under the classification. The first division was based on general size, followed by one based upon the shape of the mature seed. In addition to these a still smaller group was fixed according to the color of the seed coats and the edible pods. This portion set forth the variation of color, viz., white, black, solid color

neither white nor black, or variegated. In the same heading appeared the color of the edible pod, whether green, greenish yellow, or yellow. The terms climbing and dwarf were also used to serve as added varietal divisions.

In 1898, H. C. Irish of the Missouri Botanical Garden completed his monograph entitled "Garden Beans Cultivated as Esculents," *Mo. Bot. Gard. 12th Report*. 81-165. 1901. He began his classification with a key to three species of *Phaseolus*, based on size of seed, shape, markings, and size and color of flowers. This was followed by a complete description of each species and a key to the horticultural varieties treated. This key was based on the following characteristics in order of their importance as segregating characters: Size and shape of seeds and pods, followed by seed color, size, plant growth habit, pod length, and, for *P. lunatus*, the additional characteristics of leaf shape and season of utility.

The next publication on this crop, "American Varieties of Garden Beans" by W. W. Tracy, Jr. was issued in 1907 as United States Department of Agriculture Bureau of Plant Industry Bulletin No. 109. It was the result of a careful variety study carried out at the vegetable testing grounds at Washington, D. C., and cooperatively at several of the state experiment stations throughout the country.

Tracy developed one key based on the taxonomic characters of the five species of garden beans and another of the artificial type based on horticultural characters. This was the first attempt by an investigator to suggest for bean varieties a key that contained several plant characteristics other than those of seed and pod. An honest endeavor was made to enable the student to identify a variety regardless of the stage of development. The artificial key suggested by Tracy was unique in its application to bean variety studies.

This was followed a year later by Cornell Bulletin 260 "American Varieties of Beans" written by C. D. Jarvis of the Cornell University Agricultural Experiment Station. This paper represented the compilation of data over a period of ten years or more, since it included previous work of L. H. Bailey, cooperative work of N. B. Keeney & Son at Le Roy, N. Y., as well as the trials conducted by Mr. Jarvis at Connecticut and Ithaca.

Jarvis began his classification by citing one for field beans suggested by J. W. Gilmore of that Station. This was based on the shape, the length, and the ratio of length to width and thickness of seed. This was followed by what he termed "The Key to Economic [varieties] of the Genus *Phaseolus*." This was based entirely upon the characteristics of the dry seed the season harvested. The following characters were used: presence or absence of conspicuous converging or radiating lines extending from the hilum to the dorsal margin; width of seed; shape; solid or variegated color; color of markings; hilar markings; length, shape of cross-section; ratio of length to width; shape of ends; type of demarkation between colored and white portion; solid colored areas; stripes; prominent, non-prominent, or

depressed hilum; prominent or non-prominent hypocotyl; ventral or dorsal margin straight or rounded; and seed lop-sided or non-lop-sided.

No keys are included in this volume, but the arrangement of historical and descriptive material follows the divisions generally accepted by horticulturists as indicated below; which also follows the botanical classification except for the segregation of the field and horticultural groups.

- The Pole Varieties of Garden Beans
 - Green Pods
 - Wax Pods
- The Dwarf Varieties of Garden Beans
 - Green Pods
 - Wax Pods
- The Horticultural or Shell Beans
 - Pole Varieties
 - Dwarf Varieties
- The Field Beans
- The Lima Beans
 - Pole Varieties
 - Dwarf Varieties
- The Runner Beans

It will be seen that this grouping is also the grouping used by the seedsman in his catalog. The varieties within each group are arranged alphabetically without further differentiation into those varieties of greater or lesser importance.

GLOSSARY

Acute..... Sharp-angled; when the angle at the dorsal edge or surface of a pod is less than 90 degrees.

Anterior..... With reference to the end of the bean seed nearest the micropyle.

Apical..... The upper third of a plant; the growing point or apex.

Basal..... The lower third of a plant; the base; the portion just above the crown.

Bearing season..... The number of days from the first picking to the last, subdivided into early, midseason, or late.

Bloom..... A waxy, natural protective substance on seeds, and occasionally on leaves, stems and pods.

Blotched..... Marked with spots of irregular shape and size.

Butterfly markings..... The more or less distinct wing-like color markings about the hilum.

Carpellary suture..... The line of splitting on the dorsal surface of the pod — the opposite of the placental suture.

Climbing..... When the growth habit of a plant enables it to twine and at the same time cling to a support.

Color..... Flower colors are described by use of Ridgeway's terms; seed colors are given in common color terms with the Ridgeway term in parenthesis.

Compact..... When the growth habit of a plant is close; opposed to open habit.

Constricted... When the surface of a pod is alternately depressed and swollen to a greater or lesser degree.

Cordate..... When the cross-section of a pod or seed is heart shaped; rather deeply indented at the placental suture.

Crease-backed..... When the cross-section of a pod shows that the placental suture is indented or depressed.

Crest..... With reference to the dorsal or carpellary surface of a pod.

Crowded..... When the seeds of a snap pod are very close together, resulting in the formation of beans with truncated ends.

Crumpled..... Coarsely wrinkled.

Curved..... Concave to the horizontal plane of the upper (placental) suture.

Cylindrical.... The shape of the seed or pod approaching that of a cylinder; sides nearly parallel.

Dorsal..... The carpellary surface; in the pod it is opposite the side to which the seeds are attached; in the seed, the side opposite the hilum.

Double-barrelled..... When the cross-section of a pod shows a deep indentation at both the placental and carpellary sutures.

End..... The distal portion of the pod excluding the spur.

Elliptical..... This applies to a cross-section of a pod or seed, when its shape is like a narrow ellipse.

Erect..... When the natural growth habit of a plant is upright; not spreading.

Eye-ring..... The more or less distinct color band about the hilum.

Flat..... This applies to the width and thickness of a pod or seed when the cross-section of either is elliptical or nearly so.

Fleshy..... When a large portion of the pod is succulent and meaty; with a minimum amount of parchment and string.

Fiber..... The tough layer of parchment in the walls of a bean pod, varying in amount with the variety and stage of development.

Filled to the edge..... When the seeds in a snap pod fill it from the placental to the carpellary suture.

Filled to the tip..... When the snap pod is filled with seeds from the neck to the end.

Green-shell stage..... The period in the development of a pod when the latter is too tough to be edible yet the enclosed seeds are tender and entirely free from hardening.

Growth habit..... The type of plant produced, either dwarf or bush, or tall or viny, and more fully described by such specific terms as to express the character of growth.

Hilar surface... The area on which is located the hilum or eye; the ventral surface.

Height..... This is ordinarily meant to represent the distance from the crown to the top of the plant.

Inch mark.... A distinct cross mark appearing on pods of certain varieties, the distance between which is quite uniform — approximately one inch apart.

Internode..... The area between nodes or joints.

Loment-like... When the constrictions of the pod are decidedly deep and well defined.

Mottled..... Marked with spots of different colors, or shades of colors.

Neck..... The proximal portion of the pod, excluding the peduncle.

Nodes..... The enlargement of the stem from which originate the leaves, flower stalks and branches; the joint.

Oblate..... With reference to the cross-section of a pod when the main axis is shorter than the horizontal diameter.

Obovate..... With reference to the cross-section of a pod when the smaller end is at the placental suture.

Obtuse..... Broadly angled; when the angle of the dorsal edge or surface of a pod is more than 90 degrees.

Open..... When the growth habit of a dwarf plant is loose; the intermediate stage between spreading and compact.

Oval..... This applies when the cross-section of a seed or pod is broadly elliptical.

Ovate..... This applies to the cross-section of a pod or seed when it is more or less egg-shaped, wider at one end than the other.

Placental suture..... The line of splitting on the ventral surface of the pod along the inner side of which the seeds are attached; the portion in which the greater part of the placental vascular tissue is located.

Pods borne.... The relative position on the plant where the majority of the pods are attached.

| | |
|-----------------|---|
| Posterior..... | With reference to the end of the bean seed nearest the caruncle. |
| Prostrate..... | When the plant or portion of a plant grows more or less flat to the ground. |
| Protuberant... | When the extension of an object above the adjacent surface is pronounced. |
| Quality..... | The condition of the bean at the snap stage or its equivalent as suggested by such characteristics as fleshiness, brittleness, stringiness or their lack of them. |
| Recurved..... | Convex to the horizontal plane of the upper (placental) suture. |
| Regular..... | When the surface of a pod is without constrictions or swollen portions. |
| Reniform..... | Kidney-shaped. |
| Rhomboidal... | Applied to seeds with truncated ends when the angle of the end and the side is oblique. |
| Round..... | Applied to seeds or pods when the cross-section of either is circular or nearly so. |
| S-curved..... | Alternately concave and convex to the horizontal plane of the upper (placental) suture. |
| Scimitar-curved | When the curve of a pod is abruptly concave. |
| Speckled..... | When the color of the seed coat is dotted with very small, rather distinct, diminutive spots. |
| Spheroidal.... | Similar in shape to a sphere. |
| Spur..... | The portion of the pod extending from the distal end; the tip. |
| Straight-backed | When the cross-section of a pod shows that the placental suture in cross-section is straight, not depressed or humped. |
| Streaked..... | Marked with rather long, irregular stripes. |
| Stringiness.... | A term referring to the relative toughness of the fibro-vascular bundles along either or both placental and carpellary sutures. |
| Striped..... | Marked with a long, narrow stripe or stripes. |
| Suture..... | The edge of a pod, either the line along which a dry pod will split, or its opposite. |
| Texture..... | The condition of a pod or leaf as manifested by the presence of large or small cells; the coarseness or fineness of the "grain." |
| Trailing..... | When the growth habit of a plant is long and prostrate. |
| Truncate..... | When the seed is abruptly flattened at the ends. |
| Twining..... | When the growth habit of a plant is intermediate between climbing and trailing; plants lack the ability to cling to a support. |
| Ventral | The placental surface in a pod, the side to which the seeds are attached; in the seed, the side of the hilum. |
| Vigor..... | The vegetative condition of a plant as manifested by the comparative sturdiness of growth. |
| Wrinkled..... | A surface that is slightly ridged and furrowed. |

THE POLE VARIETIES OF GARDEN BEANS

The varieties of beans included under this class are united by only one character, expressed in the name of the group. This character, the ability to climb, is constant but does not allow separation of the varieties into this class until the plants are quite well along. The growth habit of the true pole beans is indeterminate, that of the true bush types is determinate. Differences in seed size, shape, and color; leaf size and shape; and flower color are not distinctive with either type when applied with the hope of establishing separatory characters.

The variability in plant characters of pole varieties covers a wider range than for the bush sorts. The stems range from wholly green, as in Georgian Pole, to nearly

red, as in Scotia; foliage scanty, as in Kentucky Wonder, to abundant, as in Southern Prolific; flowers white to purple, pods short and small, as in Cutshort, to very large and broad, as in Caseknife. The color, size, and shape of seed of many varieties are quite individual. Seed of Cutshort, Lazy Wife, Missouri Wonder, Oregon Giant, and Scotia are notable examples of this.

The utility of the pole beans is not markedly different from that of the dwarfs. Edible pods may be picked when quite young and free from fibre and parchment, or allowed to ripen until the young seeds become swollen but before the pod becomes dried. These are known as shell beans. Other varieties, especially those with white seed, are suitable for use as a dry bean when harvested after the pods and seed are fully mature.

It is probable that pole beans were more commonly used fifty years ago than they are today. In New York and the eastern region of the country, pole beans are generally found only in home gardens; in the South they are popular in home gardens and are also planted in the corn fields. In the Northwest, Oregon, Washington, Idaho, and Utah, pole varieties are considered a valuable market garden bean and also planted to some extent for the canning trade. In the central and southern portions of California, especially in the cooler coastal irrigated valleys, pole beans are quite extensively grown by market gardeners. For quality and yield they would seem to be very satisfactory. Possibly their lateness and the supports necessary are factors that limit their use.

The varieties of pole beans with the possible exception of those varieties which may be classed as Horticultural Beans have undergone less change than those of any other group. The relatively small number of varieties has apparently satisfied the requirements of the grower. It is of interest to note that in this group the green-podded varieties far outnumber the yellow-podded sorts. This is in direct contrast to the situation which exists in the bush varieties of garden beans. Among the older varieties of cultivated beans are Kentucky Wonder (1877), Caseknife (1820), Creaseback (1881), Cutshort (1835), and Golden Cluster (1806). These are variety names of pole beans listed since the date indicated but probably known as types for unknown ages of the past. They are still the most prominent in a long list of varieties. The following descriptions are further divided according to the color of the pod.

GREEN PODS

Advance. This bean originated with F. C. Heine-mann, Erfurt, Germany, sometime before 1900. It was introduced here in 1903 by Vaughn, and was tested on the U. S. Department of Agriculture plats in 1905 and 1906. It differs from Caseknife in habit of growth in a very small way. Tracy found it small-vined, very early, and decidedly unproductive.

Alpha. Refs. 90. The J. A. Everitt Seed Company of Indianapolis introduced Alpha in 1896 as the "earliest pole bean in existence." It was said to mature

as far North as bush beans, to be suitable for growth in corn, and to be similar in quality to Kentucky Wonder. Seeds rather flat, bright yellow, with darker eye-ring.

Big Chief. This variety was originally listed by Buist in 1925, as Indian Chief, but in 1926 the name was changed to Big Chief, since Indian Chief had long been used as the name of an old wax podded variety.

The pods are much like those of Refugee in very early stages, later more like those of Kentucky Wonder, nearly as long, fully as broad, often double-barrelled, S-curved, very short-tipped, brittle, stringless and of good quality. Seeds 10 to 12, crowded in pod, of medium size, about 85 to 90 to the ounce; broad oval or slightly kidney-shaped, not very plump, with short-rounded, or truncate ends, slightly dull black, not jet.

Black Scimitar. Refs. 47, 56, 93, 94. This variety has been grown in America, so far as known, only in a test at the Missouri Botanical Garden; but it has been widely cultivated in Europe, where it was known to Martens in 1863. Vilmorin says the pods are noticeable for their large size and beauty, losing the purplish markings with age. White Zulu, a white-podded sub-variety is described among the wax-pod beans.

Plant 4 to 5 feet tall, stout-stemmed; leaflets medium sized, pale green, considerably wrinkled. Flowers purplish. Pods green marked violet, 5 to 7 inches long, very broad, straight but twisting sidewise with short tip. Seeds very large, sometimes $\frac{3}{4}$ inch long, half as wide, kidney-shaped, plump, shining black.

Black-Seeded Kentucky Wonder. Refs. 48, 91. Introduced toward the end of the last century (1899-1903) by McCullough, and apparently listed by only a few firms, this variety has many attractive qualities that would seem to merit greater popularity. Its pods are suitable for either snap or green-shell purposes. The pods show purplish in later stages and the seeds are black, showing color early. In season it is intermediate to late, 75 days at Geneva, this is 15 days later than the earliest sorts, such as Ideal, or Sickle; 10 days later than Kentucky Wonder or Caseknife; a few days later than Scotia; and the same in season as White Creaseback or Cutshort. This variety differs from Kentucky Wonder in color of seed, in having a much more vigorous vine, more foliage, later in season, greater productiveness, and in pods of much better quality; they being thicker and more meaty. The foliage is more abundant and the leaflets are less crumpled than those of Kentucky Wonder. In general vigor and hardiness it resembles Scotia. Of similar varieties Black Kentucky Wonder probably most resembles White's Prolific but is later in season and has larger, thicker, and more crease-backed pods. White's Prolific is similar to Missouri Wonder or Rhode Island Butter Pole.

Plant a climber of large growth, $4\frac{1}{2}$ to 5 feet high with spread at base of plant of about $2\frac{1}{2}$ feet; very compact, extremely vigorous, of very long bearing period, and extremely productive; thick stemmed, many branches, which are green throughout in the younger stages but later the branches become somewhat reddish tinged. Foliage very abundant, dark green; leaflets very large, broad, flat smooth surface, occasionally somewhat crumpled, medium thick. Flowers white.

Pods light green in color. Quality good, brittle, very fleshy, somewhat stringy, practically fiberless but rather coarse in texture. Size long, quite broad and moderately slender, ($7-9 \times \frac{5}{8} \times \frac{1}{2}$ inches),

containing 7-9 seeds per pod. Shape flat, oval to cordate through cross-section, fairly straight, slightly crease-backed, regular, not crowded, smooth, filled to the tip and edge and rounded at the end. Spur short, thick and slightly recurved. Suture, placental is slightly indented and carpellary, moderately obtuse.

Seeds medium, $1.45 \times .75 \times .55$ cm. (80 per oz.), medium broad, flat sub-reniform, long oval thru cross-section, flattened altho occasionally fairly plump; ends rounded. Hilum small and flat to slightly indented. Color shining jet black over the entire surface after a very light bloom has been removed.

Blue-Podded Pole. Refs. 98. This variety was noticed in the United States at various times before it was grown at this Station in 1883, when it was said to be chiefly characterized by the dark purple color of the pods.

Plant very vigorous, tall-climbing, medium late in season, and very productive of immense pods, 10 inches long, very broad and heavy and much swollen over beans, giving a very irregular profile from side or edge, somewhat curved, very short-tipped, completely stringless and fiberless, very strongly marked violet, which color rapidly disappears in cooking. Seeds rather large, broad, flat, kidney-shaped, often transversely bent, light brown or dun, faintly mottled with chocolate, evidently darkened down from the "rose-salmon streaked with grayish lilac" of Deanaiffe's seeds of "Cosses violettes," which were of the same shape, including the distortion.

Bulgarian. Refs. 47. From the name this is supposedly of southeastern European origin. It was introduced into France in 1890, and grown in this country only at the Missouri Botanical Garden. Growth data and uses were not given by Irish; but Denaiffe commends the variety highly for its heavy, continuous production of beautiful pods of fair quality, but says it was rather late for northern or northeastern France although considered one of the best for the central section of the country.

In Missouri: Plants 2-3 feet tall, climbing, but with few runners; leaflets small, light green, slightly wrinkled, quite thin. Flowers purplish. Pods 4 to 5 inches long, slightly curved, nearly $\frac{1}{2}$ inch wide, sub-cylindrical, short-tipped, green blotched with purple. Seeds very large, half as wide as long, ovate oblong, slightly kidney-shaped, reddish brown or drab, striped and splashed drab.

Burger Stringless. Refs. 48, 52, 76, 91. Syns. White-Seeded Kentucky Wonder. Vaughan in 1903 introduced this variety as "new, one of the best pole beans, pods long, green, absolutely stringless; beans small, white, long, season." It is probably identical with Martens' Longhulsize Speckbohne, (Long-podded Bacon-bean) from which the variety McCaslan also came. Burger Stringless is probably of German origin and represents an old type of bean. While it was introduced into this country in 1903, it was not until 10 years later that it was used to any great extent, gradually increasing in popularity until in 1921 it was listed under several names by about 75 seedsmen. The pods were ready to pick in 64 days, the same in season as Kentucky Wonder. In plant habit it also resembles Kentucky Wonder, with its scanty foliage, large leaflets, and short producing season. The pods are somewhat smoother and much less constricted between seeds. An improved strain, St. Louis Perfection White, was introduced in 1927 by Ferry.

Plant small for a pole bean, 4 ft. tall with very little spread at base; good climbing habit but rather lacking in vigor, open in habit,

lightly productive with a short bearing period; stem slender; branches few and wholly green. Foliage scanty, dark grayish green; leaflets large, very broad, coarse, crumpled; $4\frac{1}{2}$ inches long by 4 inches wide, quite generally rounded, widest near base, indented at stem, short abrupt tip. Flowers white.

Pods dark, dull, silvery green in color. Quality excellent; very brittle and tender, fleshy, stringless, fiberless and of fine texture. Size long, fairly broad and fairly plump ($6-7\frac{1}{4} \times \frac{1}{2} \times \frac{7}{16}$ inches), containing 8-9 seeds per pod. Shape round, broad oval to nearly circular in cross-section, curved, crease backed, constricted, not crowded, smooth, filled to the tip and edge, and rounded to somewhat truncate on the end. Spur short, medium slender and recurved. Suture, placental is indented and carpellary, rounded to obtuse.

Seeds medium to large, $1.5 \times .85 \times .45$ cm., (90-95 per oz.); broad reniform, flat, thin, long oval thru cross-section, indication or tendency towards a slight twist; ends abruptly rounded to truncate. Hilum small, flattened. Color white, faintly marked with grayish vein-like under pattern.

Caseknife. Refs. 10, 12, 13, 15, 20, 28, 47, 48, 52, 59, 63, 67, 68, 79, 91, 97, 98. Syns. Dutch Caseknife, White Case Knife, Case Knife Runner. This is one of the oldest known varieties in America, the name Caseknife and its many strains or synonyms, some of which undoubtedly deserve record as true varieties and others which differ but slightly from the type as grown today, have been noted in the literature since 1820. In the *Country Gentleman* of 1856 it was listed as a leading pole bean. Comparing it to some varieties which are in the same general group, we find Caseknife similar to Advance but later in season and more productive. White Soissons has larger seeds and very long, wrinkled pods. Liancourt seems to be intermediate between Caseknife and White Soissons, the pods being more curved, more swollen over beans, and more constricted than those of Caseknife, while the beans are longer, more plump, and little or not at all distorted, yet the dry seeds are not as plump nor as round at the ends as those of Soissons. As a shell bean Caseknife ranks in quality with Lazy Wife and Worcester Mammoth. Caseknife and Early Giant Advance are considered the flattest podded varieties under cultivation in this country. The variety is not of commercial value since it is a low yielder and the pods, which are tough and thin-walled, are not suitable as snap beans. It may be suitable for home use as a late green shell bean. In season it is early for a pole bean, the pods are ready in 65 days or pickable at the same time as Kentucky Wonder, 5 days earlier than McCaslan, 10 days earlier than Scotia and Cutshort, and nearly 20 days earlier than Lazy Wife.

Plant of only medium growth, 4 to $4\frac{1}{2}$ feet high with spread at base of $1\frac{1}{2}$ feet; climbs well, rather rank grower, twining rather loosely; stout stemmed, few branches, green thruout; vigor fair, moderately productive with short bearing period. Foliage scanty, medium to light green, crumpled, and wrinkled, slightly rough, rather thin and papery; leaflets large $4\frac{7}{8}$ to $5\frac{1}{2}$ inches long, very broad ($4\frac{3}{4}$ inches) from very near base to one-third distance to tip, margins decidedly rounding, base indented at stem, tips small, abrupt. Flowers white.

Pods light silvery green in color. Quality poor; stringy, fibrous, quite tough, slender, ($7\frac{1}{2}-9 \times \frac{3}{4}-\frac{7}{8} \times \frac{1}{16}-\frac{1}{2}$ inches), containing 7-8 seeds per pod. Shape very flat, ovate-acuminate in cross-section, straight to somewhat curved, straight backed, somewhat constricted, not crowded, smooth, filled to the tip but not to the edge and rounded or sharply tapered at the end. Spur long,

slender, and recurved. Suture, placental is flat and carpellary, acute.

Seeds very large, $1.7 \times .9 \times .5$ cm., (75 per oz.) oblong reniform, wide, flattened, when dry often irregular, twisted or curved, quite uniform and plump when green, ends rounded. Hilum small, slightly protuberant. Color, ivory white, thru which grayish veinlike marking appears over the entire surface; a very pale yellowish tinged, narrow eye-ring somewhat in evidence.

Cherry Pole. Refs. 47, 56. This variety is known in America only through the Missouri Botanical Garden test of 30 years ago. It is considered inferior to Mont d'Or, which it resembles very closely. Irish says the plants were identical, the flowers rather lighter in color, and the seeds a little larger. Denaiffe thought it later than Mont d'Or with less fleshy pods which never become wholly yellow, and which were more stringy. Of the seeds described and illustrated by Denaiffe, those of Cherry were the smaller and more nearly circular. Mont d'Or is described with the wax-podded pole beans.

Climbing French. Refs. 52. Syns. Climbing Canadian Wonder, Tender and True, Veitch's Climbing French. A climbing sport of the group of dwarf beans to which Canadian Wonder belongs. It is probably the most widely grown climbing French bean grown in England. The type has split up into minor forms, having seeds very much alike in color and size but differing in minor characters of foliage and pod. Many strains show plants with both green and yellow pods.

Plant, branched, vigorous, $3\frac{1}{2}$ to $4\frac{1}{2}$ feet high; foliage medium abundant. Flowers lilac. Pods 4 to 7 inches long, straight, flat, pale green or waxy yellow, with little string. Seeds large, long, kidney shape, shining purple.

Cream Pole. Refs. 63. Farquhar sent this variety to the Kansas Station for trial in 1889, probably the same year of its introduction. It was carried for a few years by this firm, but never became well known. In the Kansas test it was late, but quite productive.

Plant medium in size; leaflets medium to large, rather thick and coarse. Flowers violet. Pods 4 inches long, nearly straight, $\frac{5}{8}$ -inch wide, flattened, light green, whitening later. Seeds 3 to 5, very large, rounding oval, flattened, greenish white at green-shell stage, when ripe, smooth, dun-colored with dark brown eye-ring.

Creaseback. Refs. 28, 48, 63, 91, 97. Syns. Earliest of All, Ewing Prolific Pole, Fat Horse, July Pole, Missouri White Cornfield, Mobile Pole, Straight Creaseback, White Creaseback. Martens describes, under a name which translated means "White Bean," a pole type which he considers the predecessor of Princess and which corresponds very closely to Creaseback. He considers this identical with beans found among the upper Missouri River Indians by Prince Maximilian of Wied. This apparently confirms Tracy's statement that Creaseback, which was brought to notice by Frotscher in 1881, had been grown in the South many years before this date. The extensive synonymy strengthens the presumption that the variety is very old, but probably originated in the United States.

Tracy described two types; one very early and similar to Kentucky Wonder in having slow-growing, slender vines, small at first, and easily crowded out by the strong-growing plants of the other type, and a later



MISSOURI WONDER



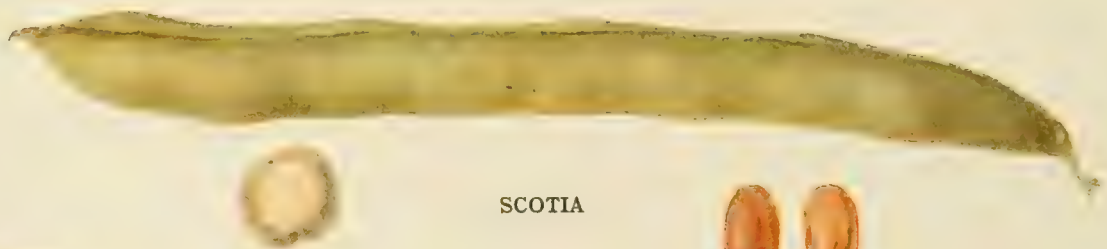
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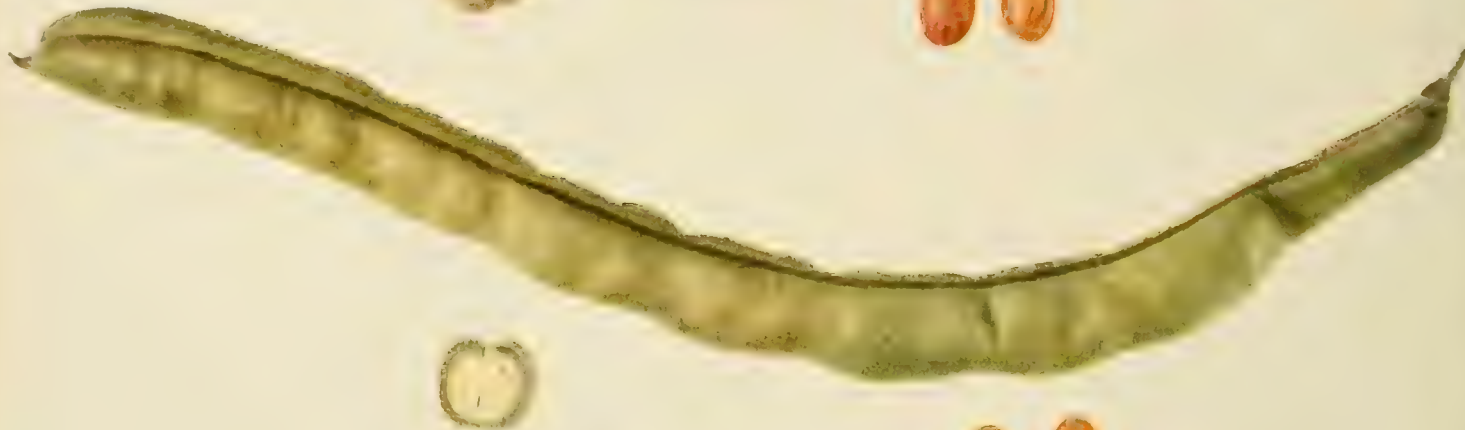
SOUTHERN PROLIFIC



DUTCH CASE KNIFE



SCOTIA



KENTUCKY WONDER



CUT SHORT



OREGON GIANT

flatter-podded and inferior strain. He strongly recommended elimination of these inferior plants, but they appeared in some strains as grown at Geneva as late as 1929 especially in a strain listed as Earliest of All. The stocks grown in 1930 were uniformly of the early or true type and the descriptions are from this growing. At Geneva, Creaseback was considered in the second early group with edible pods ready in from 68 to 72 days or from 3 to 5 days later than Kentucky Wonder, 3 days later than Caseknife, and 10 days later than Lazy Wife. The pods are very similar in size and shape to Scotia, lacking, however, the purple under-coloring. The plant in growth habit is not so open nor lacking in foliage as are the plants of Kentucky Wonder. The foliage appears much brighter, the vines more branched, and the leaflets less crumpled.

Plant small, rather bushlike at early stages but climbing well later, compact at base of plant with little branching above. Vines $4\frac{1}{2}$ and more feet high with spread of 2 feet at base; vigor good, hardy, moderately productive, maturing all pods within a short period; slender stemmed, branches few, wholly green. Foliage medium abundant, dark green; surface smooth, somewhat crumpled, light veining, medium in thickness; most leaflets curled so that underside is cupshaped, medium to large, $4\frac{1}{2}$ inches long by $3\frac{1}{2}$ inches broad, regular in shape, widest nearer base, rounded to stem, straight taper to short tip. Flowers white.

Pods dark dull green in color. Quality very good; very fleshy, quite stringless, not fibrous, brittle, and fine in texture. Size medium long, fairly broad and plump, ($5-6 \times \frac{1}{2} \times \frac{1}{16}$ inches), containing 6-8 seeds per pod. Shape round, nearly circular in cross-section, straight to slightly curved, deeply crease-backed, regular, not crowded, smooth, filled to the tip and edge, and rounded at the end. Spur short, slender and slightly curved. Suture, placental is indented and carpellary, rounded to obtuse. Seeds small to medium, $1.25 \times .7 \times .5$ cm., (110-130 per oz.); oval, sub-reniform, fairly plump to somewhat flattened; ends usually rounded, occasionally inclined to be truncate. Hilum small, flattened. Color ivory white, faintly marked with a veinlike under pattern.

Curious Pole. This was grown from seed sent to Gregory, the sender stating that it originated as the result of a cross between Dwarf Horticultural and Dreer Lima, which cross Gregory believed impossible. He listed the variety in 1885 and it was grown at Geneva in 1886. It was quite early (76 days from planting to edible pods) and averaged more than 40 pods to the plant.

Cutshort. Refs. 13, 47, 63, 67, 68, 91. Syns. Cornfield Pole, Corn Hill Pole, Red Speckled, Red Cut Short, Red Speckled Oval Seeded. This type of pole bean was first known as early as 1835 under the name Corn Bean. Later it became known as Corn Hill and sometime during the early eighties as Cutshort. Cutshort thus is an old variety with many names; but it is doubtful whether the name Corn Bean, given by Tracy as the earliest one used for it, is more than a general name applying to other varieties as well; at least the Corn Bean described by Burr was too long-podded and its seeds too flat and too brown to be considered identical with Cutshort.

Cutshort as a name was unknown to Martens, but Burr's Corn Bean was probably Martens' *Phaseolus gonospermus costaneus*. Cutshort would fall in the same group of truncated or angular beans, but could not be mistaken for any of the nine varieties included in

this group by Martens. Irish's Corn Bean, in spite of some discrepancies in foliage and in seed color, is evidently Cutshort and not Burr's Corn Bean.

Cutshort is largely a southern bean, rather too late for New York. In the South it can be grown in corn, and is valued mostly for the snap pods. Its productivity counter-balances the smallness of its pods and their lack of quality when past early stages. The pods are too small for market purposes. In 1901 Cutshort was listed 129 times under 7 names in seedsmen's catalogs, in 1906 and 1921 each 101 times, and in 1931 by 35 of the leading houses. Its season is intermediate to late, at Geneva 75 days, or 10 days later than Kentucky Wonder, Ideal Market, or Sickle, 3 to 5 days later than Scotia, and a week earlier than Lazy Wife. Cutshort does not resemble any other pole variety, the small-sized pods are quite similar to the pods of navy bean field type. The shape and color of the pods are similar to those characters in pods of Lazy Wife, but in size the pod is much smaller and the seed is red speckled instead of white.

Plant medium to large in size, climbing well, loosely twining, 4 to 5 feet tall with spread at base of about $2\frac{1}{2}$ feet; vigor good, very productive over a long season; thick stemmed, moderately branched, wholly green. Foliage abundant, very dense at base of plant, medium to dark green, surface glossy, slightly crumpled, smooth, medium veining, thin; leaflets small to medium, $3\frac{3}{8}$ by $3\frac{1}{4}$ inches wide, with longer laterals, widest very near bases which are almost straight along margin, sides gently curving to very obscure, but with pointed tips. Flowers white.

Pods medium to dark green in color. Quality fair; quite brittle, fairly fleshy, slight amount of string and fine texture. Size short, broad and medium, quite plump, ($3-4 \times \frac{3}{8} \times \frac{3}{8}$ inches), containing 4-5 seeds per pod. Shape round, broad oval in cross-section, slightly curved, straight backed, slightly constricted, very crowded, quite smooth, filled to the tip and edge and abruptly rounded to truncate on the end. Spur short, medium stout and straight. Suture, placental is flat and carpellary, obtuse to rounded.

Seeds small, $.9 \times .8 \times .5$ cm., (105-110 per oz.), generally quite variable in shape, however, most of them are rhomboidal, rather thin and flattened; ends truncate. Hilum large, flat. Color dingy gray (pallid purple drab) thru which reddish-gray (light vinaceous-gray) vein-like markings appear; dotted and splashed with purplish crimson (bordeaux) on hilar surface; prominent reddish brown, medium wide eye-ring present in all instances.

Delicious Giant. This rather late introduction, 1925, originated with Gill Bros. as a cross between Oregon Giant and Kentucky Wonder. It was earlier and more prolific than Oregon Giant and a decided improvement on that variety. This variety and Oregon Giant are quite unusual in size of pod clusters, size of pods, and in pod color.

Pods like those of Oregon Giant, or even longer, more slender, almost round in cross-section, crease-backed, better filled by seeds more beautifully marked with red, and of a better quality. Seeds are of the size and shape of Kentucky Wonder, with grayish brown or medium brown ground color and more mottled than striped with numerous dark brown or black markings.

Dwarf Lima. Refs. 63. This was listed by Northrup, Braslan Goodwin Co., about 1890, and tested at the Kansas Station. It was found to be neither dwarf nor a lima; but a pole bean of moderate height and vigor, somewhat like Cranberry Pole in habit, early, and productive.

Foliage dark green; leaflets of medium size, broad, rough. Flowers white. Pods 5 to 7 inches long, nearly straight, $\frac{5}{8}$ to

$\frac{3}{4}$ inch wide, green. Seeds 4 to 6, white when young, oval, between plump and flattened, taffy yellow, polished, indistinctly veined.

Everbearing Stringless. This variety originated with Buckbee before 1913. It is said to be from a Kentucky Wonder X Lazy Wife cross, in general characters similar in every way to Kentucky Wonder except for color of seed which is white.

Plant, climbing habit good, exceptionally early, producing clusters of dark green pods, 7 to 9 inches long, somewhat crease-backed, almost straight near stem, curved at tip, depressed between beans at green-shell stage, entirely stringless and containing 5 to 7 white seeds, shelling easily.

Georgian Pole. Refs. 100. The lateness in maturing pods of Georgian Pole indicates an origin under southern conditions. H. G. Hastings introduced the variety in 1918 having secured the stock from a local dealer who had had some trade for it for some years back. Its true origin has never been definitely ascertained. As grown at Geneva it produced edible pods the last of September, but no ripe pods or dry seeds. Throughout the season the growth of the plants was very noticeable, the dark green foliage covering the trellis even under the worst drought conditions possible. The plants are resistant to drought and heat and also grow strongly when planted in corn in spite of the shading. The pods are comparatively small, resembling pods of Ideal Market and Ward's Prolific but entirely green. The seeds are quite similar in color to those of Kentucky Wonder but smaller, plumper, and somewhat different in shape.

Plant tall growing, 4 to 6 feet, climbing well, compact at base of plant and throughout; foliage dense, very dark, smooth, glossy; leaflets large, with terminals smaller than laterals, $4\frac{1}{4}$ by $4\frac{1}{4}$ inches and 5 by 4 inches respectively in general shape like those of Kentucky Wonder but rather more rounded. Flowers white.

Pods light green in color. Quality good; quite fleshy, almost stringless, fiberless, brittle, tender and fine in texture. Size medium long, moderately broad and fairly slender, ($4\frac{3}{4}$ - $5\frac{1}{4}$ x $\frac{7}{16}$ x $\frac{5}{16}$ inches), containing 6-7 seeds per pod. Shape flat, oval in cross-section, straight, slightly crease-backed, regular, fairly crowded, smooth, filled to the tip and edge and tapering at the end. Spur short, stout, and curved to occasionally recurved. Suture, placental is flattened to somewhat rounded and carpellary, moderately obtuse.

Seeds small, 1.2 x .65 x .5 cm., (115-120 per oz.); short oval, somewhat flattened; ends round. Hilum small, flattened. Color brown drab (drab) to grayish brown (hair brown) of varying intensity over the entire surface, marked with a dark, reddish brown, narrow eye-ring.

Holstein. Whether one or two varieties are included under this name is unknown. Seeds of the "Holsteiner Bohne" were received at this Station from Germany, and grown in 1883. The name would imply that the seeds were white and black, these being the color of Holstein-Friesian cattle. Buckbee listed the Holstein pole bean as "my own introduction" in 1894, but does not claim origination; so it is probably the same as the "Holsteiner Bohne." It was said to be the earliest pole bean, which the Station data practically confirms, only one other variety, Orleans Red, producing earlier pods. At the Michigan Station the beans were said to be "peculiarly marked red and white."

Ideal Market. Syns. Black Creaseback. This was originally introduced in 1914 as Black Creaseback

by Van Antwerp's Seed Store of Mobile, Alabama. A local farmer had noticed in a planting of White Creaseback a single plant different in growth and with black seeds. When planted the next year it came true and was considered as a new variety. In 1924 it was reintroduced by Chris Reuter Seed Co. of New Orleans as Reuter's Ideal Market under which name it is now generally cataloged. It is rapidly gaining popularity as a valuable early and productive small-podded pole bean, very hardy and vigorous. As grown here and as seen in eastern trial grounds, it is fully a week earlier than any other pole bean; nearly two weeks ahead of Kentucky Wonder and Scotia. The pods are very similar in appearance to those of Refugee with inch marks when pods are well swollen.

Plant is of moderate height, 3 to $3\frac{1}{2}$ feet tall, spread at base of $1\frac{1}{2}$ feet, compact growth, stems marked reddish, branches few. Foliage scanty, light to medium green, rather fine; leaves rough, crumpled, medium veining, slight pubescence, thick. Flowers phlox purple with noticeably long wings. Pods light silvery green in color. Quality excellent; fleshy, brittle, tender, stringless, fiberless and fine in texture. Size moderately long, rather narrow and quite plump, ($5-5\frac{1}{2}$ x $\frac{3}{8}$ - $\frac{1}{2}$ x $\frac{1}{2}$ inches), containing 5-6 seeds per pod. Shape round, broad ovate to cordate in cross-section, straight to moderately curved, creasebacked, regular, not crowded, smooth, filled to the tip and edge and rounded at the end. Spur short, thick and moderately straight. Suture, placental is slightly indented and carpellary, obtuse. Seeds small, 1.1 x .5 x .4 cm. (140 per oz.); oblong, oval, occasionally sub-reniform, moderately plump to somewhat flattened, oval in cross-section; ends uniformly rounded. Hilum medium, flattened to slightly indented. Color, shining jet black over the entire surface.

Intestin. Refs. 47, 93, 94. Intestin was grown at this Station in 1883, and was also described by Irish. It is an old French variety originating with Mons. Perrier of Bathie, and has never been commercially grown in America. Denaiffe confused it with Creaseback, which it somewhat resembles in pods, although Intestin pods are much shorter and more like those of Lazy Wife. The seeds, by their kidney-shape and distortion, with the eye not central, are more like those of McCasland, but thicker.

Japan. Refs. 47, 93, 94. The only record of this variety in America is in the tests at the Missouri Botanical Garden previous to 1901. It had been grown in France for some time but was losing in popularity because of the better quality of the newer varieties.

Plant 4-5 feet tall with strong stem and few runners. Foliage abundant, light green, wrinkled, thick; leaflets as broad as long, small. Flowers purplish. Pods 4 to 6 inches long, more than $\frac{1}{2}$ inch wide, flat, much curved, with short, slender, curved tips, much waved along ventral edge, fiberless, green during edible stage, then yellow. Seeds very large, nearly $\frac{3}{4}$ -inch long, two-thirds as wide, very broad kidney-shaped, very flat, sometimes slightly contorted, coffee brown.

Java. Refs. 47. This variety like the preceding is known only through the trials at the Missouri Botanical Garden. It was thought to have been introduced from Java, first into Germany and later into France and England.

Plant smaller than Japan, more viny, with straighter, rounder, more attractive pods, without strings or fiber until beans are well formed, fleshy and tender. Seeds smaller than those of Japan,

proportionately narrower and with ends more unequal. Color yellowish brown, with darker eye-ring.

Jordan Self-Drier. Dr. Jordan of southeastern Pennsylvania obtained seed of a pole bean from a German farmer near Schellsburg, Bedford Co., Pa., about 1921. After several years' trial it was introduced by Schell. It continues to be listed only by the introducer and is too late in season to be of much value in the North. The introducer states the pods are so stringless and fiberless that the dried pods can be utilized during the winter as a substitute for snap beans. The green shell beans are too small for general favor, but the dry beans are excellent.

Plants vigorous, dark green, productive, very much like Lazy Wife, but much later, with broader, rather shorter pods, broad-oval in cross-section, slightly curved and sometimes curved forward instead of backward. Seeds almost perfectly globular, with very glossy surface, often decidedly wrinkled, ivory white, about 80 to the ounce.

Kentucky Wonder. Refs. 11, 29, 36, 47, 48, 52, 58, 59, 67, 68, 77, 85, 91, 97, 98, 99. Syns. American Sickie Pole, Eastern Wonder, Egg Harbor, Georgia Monstrous Pole, Improved Southern Prolific, Missouri Prolific, Old Homestead Pole, Texas Pole. This most popular pole variety has probably been grown in the South for three-quarters of a century, but was first mentioned in the *Country Gentleman* of 1864 under the name of Texas Pole which is one of its present-day synonyms. James J. H. Gregory & Sons introduced the name Kentucky Wonder in 1877 and as such or as one of its numerous synonyms it has been by far the most popular pole bean grown. In 1901 it was found listed 214 times in trade lists and 20 years later 287 times under 27 different names or nomenclatural combinations.

Kentucky Wonder as a type was unknown to Martens, although he received seeds of many other Southern pole beans. It does not appear in available German catalogs, but has been grown and described in both England and France. The name which this variety enjoys and its early introduction have given Kentucky Wonder a standing that has become a "habit" to home gardeners. The performance of the variety merits this popularity for it is relatively early, hardy, of good productivity over a rather short season, and has large, fleshy, stringless, fiberless pods of excellent flavor. In season it belongs in the early group, the first pods being ready in 64 days at Geneva. The pods of Kentucky Wonder are easily identified by the peculiarly wrinkled surface and their great length. This wrinkling of surface is also a characteristic of Tennessee Wonder, but the pods of this variety are larger and show a purplish tinge and the seeds instead of a solid brown color are slate gray with strips of black olive.

Plant small to medium in size; $4\frac{1}{2}$ feet or more tall with spread of about $1\frac{3}{4}$ feet at base; of good climbing habit but rather open in growth; vigor not more than moderate, rather short bearing period and yield only fair. Stem slender, internodes long; branches few, green thruout. Foliage scanty, dark green, dull, rough, crumpled, medium veining, of medium thickness; leaflets $3\frac{3}{4}$ inches long by $3\frac{1}{4}$ inches wide, greatest width near base or one-fourth the distance from it, laterals very one-sided, margins curving smoothly to bases but almost straight to short, obscure tips. Flowers white.

Pods light silvery green in color. Quality good; slightly stringy, fiberless, brittle, tender, and of rather coarse texture. Size long, broad and plump, $(7-9 \times \frac{1}{2} \times \frac{3}{8}-\frac{5}{8})$ inches), and containing 8-10 seeds per pod. Shape round broad oval, much curved, somewhat S-shaped, crease-backed, constricted, not crowded, wrinkled, rough, filled to the tip and edge, and blunt to somewhat rounded end. Spur short, medium slender, slightly curved.

Seeds medium $1.6 \times .65 \times .5$ cm., (80-85 per oz.), broad oblong, occasionally somewhat reniform, somewhat flattened; long oval in cross-section; ends rounded. Hilum medium large, slightly indented. Color buffy brown (saccardo's umber) marked with very indistinct vein-like pattern of a darker shade over the entire surface; dark red to mahogany brown (burnt sienna) narrow eye-ring present in all cases.

Lazy Wife. Refs. 32, 47, 48, 52, 56, 59, 63, 91, 93, 94, 97, 98. Syns. White Cranberry, Sophie, Maryland White Pole, White Cherry. Maule in 1894 says Lazy Wife originated in Bucks Co., Pa., but it was probably brought there by German settlers. When comparison is possible it corresponds in every way with Martens Sophie bean, which he says was noted by Savi in 1822 as San Domingo bean; and Tracy says the variety was known in America as early as 1810 as White Cherry Pole or White Cranberry Pole. In France the type is known as Coco Blanc. Irish describes Sophie but evidently this was only a semi-climbing type. Its maximum height is given as from 3 to 4 feet. It is of equal value in the home garden as a snap or green shell bean and is also a good late variety for the market. At Geneva it produced its pods very late, 80 days from time of planting, about the same in season as Ward's Prolific and about one week later than Southern Cornfield and one week earlier than Georgian Pole. As a late snap pole bean it is excelled in quality by Scotia and Black-Seeded Kentucky Wonder, but as a shell bean it is probably unsurpassed.

Plant large, $4\frac{1}{2}$ feet tall and more with spread at base of plant of $1\frac{3}{4}$ feet; noticeably a poor climber while getting started but later often classed as a rank grower, compact, moderately vigorous, of long bearing period, productive; thick stemmed, much branched, wholly green. Foliage very abundant, medium green; leaf surface, glossy, smooth, crumpled, thick; leaflets large, more than 5 inches long, $3\frac{1}{2}$ to 4 inches wide at about one-fourth the distance from the base, well rounded to stem, straight sided, tapering to medium long tip. Flowers white.

Pods dark to medium, glossy green in color. Quality good; fairly fleshy, stringless, almost fiberless, brittle and fine in texture. Size medium to long, broad and slender, $(5\frac{1}{2}-6 \times \frac{5}{8}-\frac{3}{4} \times \frac{3}{8})$ inches), containing 5-7 seeds per pod. Shape flat, ovate-acute in cross-section, straight to very slightly curved, straight backed, much constricted, smooth, filled to the tip and edge and abruptly rounded on the end. Spur long, medium slender, somewhat tapering, and straight. Suture placental is flat and carpellary decidedly acute. Seeds small, $1.1 \times .9 \times .8$ cm., (70-80 per oz.); spheroidal, very thick, nearly cylindrical in cross-section, very plump; ends well rounded. Hilum small, rounded. Color ivory white, marked with a distinct, grayish, vein-like under pattern over the entire surface.

McCaslan. Refs. 52. This variety was for many years in the possession of the McCasland family in Georgia and on the death of Mr. McCasland the stock seed was turned over to Hastings who first offered seed for sale in 1912. This variety is grown chiefly in the South where popular usage has shortened the name to McCaslan. Apparently it is an earlier type of

Burger Stringless, more productive, and with pods that are flatter and more twisted.

Plant similar to Burger Stringless in all plant characters. Pods dark green in color. Quality fair; fairly brittle and tender, some stringiness, small amount of fiber, good flavor but rather coarse in texture. Size long, broad and slender, ($7-8 \times \frac{5}{16} \times \frac{7}{16}$ inches), containing 7-8 seeds per pod. Shape flat, cordate to long ovate in cross-section, irregularly curved, straight backed, slightly constricted, crowded, smooth, filled to the tip but not to the edge and rounded to blunt on the end. Spur short, medium thick and straight. Suture, placental flattened to slightly indented and carpellary, acute. Seeds medium, $1.7 \times .85 \times .5$ cm., (80-85 per oz.), somewhat smaller than seed of Dutch Caseknife; oblong, reniform, flattened and inclined to be somewhat twisted, altho not as much so as the above named variety; ends rounded. Hilum small, flattened. Color ivory white, thru which a grayish vein-like under pattern is apparent over the entire surface.

Marshall. Refs. 97, 98. Thorburn's catalog of 1882 lists this variety. It was grown at Geneva that year. The record indicates that it was exceedingly late and the most productive in weight of beans of any variety tested. As only the ripe pods are described, it was undoubtedly a variety suitable only for the green shell and dried beans.

Plant tall, with abundant, rather dark green foliage, large, broadly ovate leaflets, inclining to triangular, taper-pointed. Pods $6\frac{1}{2}$ to 7 inches long, much swollen and wrinkled, sabre-form, somewhat flattened, parchment like, light dun yellow. Seeds 4 to 5, oblong, very broad, kidney shaped, quite strongly flattened side-wise, rarely compressed at the ends, more than $\frac{1}{2}$ inch long, two-thirds as wide, rather more than one-third as thick, pale dun yellow, striped with brighter yellow in rings concentric about the eye, with dark, reddish brown eye-ring.

Missouri Wonder. Refs. 13, 48, 91. Syns. Nancy D., Noxall, Prolific Green Pod, Rhode Island Butter, White's Prolific Pole. The original form of this bean is quite unknown. The evidence now available indicates its synonymy with those varieties mentioned above and possibly also with still another variety known nearly 50 years ago (Ferry catalog 1889) as Rhode Island Creaseback. Rhode Island Butter Pole is a name listed by seedsmen at least since 1867 and is considered the oldest of the names mentioned, since it was grown for many years previous to its being listed. White's Prolific Pole by some is said to have been known as early as 1850 and to have originated either as a renamed Rhode Island Butter or as a southern variety coming from Fulton S. White of Birmingham, Alabama. These two varieties were considered identical. Evidently this type gradually passed from popular use for at the beginning of the century we find it reintroduced under different names. Wm. Henry Maule in 1901 offered New Prolific Green Pod Pole which was renamed Noxall the next year after a prize name contest won by Mr. W. C. Richards of Carleton, Michigan. At that time it was stated that the variety had been grown by one family for a period of 60 years. About this same period the name Missouri Wonder became identified with a type grown in the middle west. Henry Field was one of the first to list it under this name. In his catalog of 1907 nearly one entire page was devoted to extolling its merits. Nancy D, another name for the variety, is of more recent origin, coming from Ferry in

1924. The original stock came from Mrs. Nancy Davis of Hazard, Kentucky. She asked that it be called Nancy Davis. However, since Scotia or Striped Creaseback is now offered by some under the name Nancy Davis, Ferry, to avoid confusion, called the variety simply Nancy D. Three of these names, Missouri Wonder, Noxall, and Nancy D. were listed in 1931, and we have chosen the name Missouri Wonder.

Under Geneva conditions it proved to be an excellent sort with vines productive of pods especially suitable for use for the green shelled beans. The same in season as Kentucky Wonder or McCaslan, one week earlier than Scotia.

Plant large, climbing well, branched, green throughout. Leaflets small to medium, rather dark, broad, crumpled, rough surface. Flowers white.

Pods medium green in color, lighter than Kentucky Wonder. Quality poor, tough, stringy, quite fibrous but medium fine in texture. Size medium to long, moderately wide and very plump ($5\frac{1}{2}-6 \times \frac{1}{2} \times \frac{3}{8}-\frac{1}{2}$ inches), containing 6-7 seeds per pod. Shape round, cordate thru cross-section, curved, creasebacked, occasionally straight backed, moderately constricted, not crowded, smooth, filled to the edge but not to the tip and rounded at the end. Spur long, slender and slightly curved. Suture placental is indented and carpellary obtuse.

Seeds large, $1.7 \times .9 \times .6$ cm. (65-70 per oz.). Shape oblong sub-reniform, sometimes much shorter, usually plump, occasionally somewhat flattened, oval to moderately broad oval thru cross-section. Ends usually irregular, not truly truncate, occasionally rounded and often wedge-shaped—not very uniform. Hilum small flattened, sometimes very slightly depressed. Color (pale pinkish cinnamon) tinged with (vinaceous-grey) to form a finely mottled undercolor, splashed irregularly over the entire surface with a drab (citrine-drab) and marked with a distinct, moderately broad, two-toned color eye-ring, the inner portion of deep orange brown (tawny) shading toward the outer portion with a tawny yellow (deep chrome).

Mottled Prolific. This is probably the original type from which Tennessee Wonder came, or an unnamed closely related strain later introduced as Tennessee Wonder or Striped Sickle. It differs from these varieties in much shorter pods, about $4\frac{1}{2}$ inches long, borne usually in pairs only, and in more flattened seeds often with truncated ends. It was very productive but late and the young pods were tender and of fine quality.

Olathe Prolific. This variety is known to us only through its listing by Northrup in 1893 as a new pole bean, and described as a new climber, very early, with fleshy, stringless pods 7 to 8 inches long, each with six or seven large, flat kidney-shaped beans, white with brownish or metallic spot or stripe.

Oregon Giant. Syns. Dickenson's Yount, Mother's Favorite, Routledge Giant. This bean of western origin has been known for some time and is very popular in the Pacific Northwest. The pods in our tests have been larger than pods of most pole varieties and were produced in abundance and fairly early.

Plants not specially characteristic but leaflets decidedly long for pole beans, especially the laterals which are very one-sided. Flowers pink, well distributed over the vines. Pods $8\frac{1}{2}$ to $9\frac{1}{2}$ inches long, curved in S-shape, $\frac{5}{8}$ to $\frac{3}{4}$ inch wide, cordate-ovate in cross-section, rather thin-walled, inflated, constructed between beans, not filled to the edge by the beans, somewhat tough, stringy, coarse-textured, of only fair quality, very light, waxy green, strik-

ingly marked brownish purple. Seeds 7 or 8, rather like those of Tennessee Wonder, but with lighter, more pinkish or light brown ground color and with broken rather than continuous black lines, dashes and spots of black, large, broad-kidney shaped, $\frac{1}{2}$ inch or more in length, plump to slightly flattened, about 50 to the ounce.

Pale Dun Runner. Refs. 97, 98. The time when this bean first came into use is unknown. It is now impossible to distinguish present types or strains referred to as "dun-colored" with similarly named varieties mentioned in early bean literature. The variety was grown at this Station in 1882 and found to be very late and much better in productivity than other green-shell pole beans, although in this respect it was not equal to Marshall.

Plant very vigorous and tall-growing; foliage abundant; leaflets large, broad-ovate inclining to lozenge-shaped, moderately taper-pointed. Pods 5 to $5\frac{1}{2}$ inches long, straight or nearly so, with medium length, slender tips, swollen by beans, wrinkled, pale dun color splashed with violet. Seeds usually 5, nearly $\frac{1}{2}$ inch long, three-fourths as wide, two-thirds as thick, approaching globular, occasionally truncate, with eye more or less protuberant, polished, shining pale dun or light brown, with bright yellow eye-ring.

Phenomenon. This bean was first introduced into this country by Vaughan in 1913, but the variety originated about 1905 in Germany with J. C. Schmidt. From fragmentary descriptions it appears to have been much like McCaslan.

Pods long ($7\frac{1}{2}$ to $9\frac{1}{2}$ inches), flat round, sometimes with flat-podded rogues, almost straight, very fleshy, smooth-surfaced, swollen over beans, more or less stringy when old, but not fibrous. Seeds of medium size, white.

Powell Prolific. Refs. 48, 91. This variety originated with E. P. Powell of North Carolina, and was introduced in 1887 by A. T. Cook. It is a very late variety, producing its slender, curved, short pods in clusters scattered thickly over the compact, vigorous vines.

Plant, vines heavy, of moderate height, climbing well. Flowers lilac. Pods $4\frac{1}{2}$ to $5\frac{1}{2}$ inches long, straight for two-thirds length from stem, then curving gently to rounded ends with very short tips, very broad oval or circular in cross-section, $\frac{3}{8}$ inch or more in diameter, with flat dorsum, fleshy and thick-walled, but rather tough, stringy, not fibrous, coarse-textured, poor in quality, light-green with purplish shading. Seeds 8 or 9, crowded in pods, about $\frac{3}{8}$ inch long, nearly half as wide, short oblong with very short-rounded often truncate ends, quite plump, deep dull black, about 150 to the ounce.

Predome. Refs. 13, 32, 47, 52, 93, 94. Syns. Prudhomme, Prodommet. At one time Predome was grown in the United States in a limited way, being described by both Burr and Irish but not by Tracy or Jarvis. This pole bean has long been very popular in France, where it is still listed and highly recommended, and was considerably used in England as late as 1919. In many respects the variety is perhaps most like Princess but with fleshy pods exceedingly like those of Lazy Wife, though not quite so thick and with tip extending on dorsal edge rather than from center.

Plant climbing, 5 to 6 feet moderately vigorous, stem slender. Foliage medium abundant to scanty; light green, leaflets small 2 to $2\frac{1}{2}$ inches long and from $1\frac{1}{2}$ to $1\frac{3}{4}$ inches wide, thin, wrinkled. Flowers, white. Pods green, tender, brittle, slightly stringy, fiberless, good quality, slightly flat, short, 3 to 4 inches long, $\frac{1}{4}$ inch

broad, straight, spur short, thick. Seed slightly flattened, sub-truncate, white.

Princess. Refs. 13, 47, 52, 56, 93. In Europe this variety was widely grown during the first half of the last century. It was known to Martens and was described by Burr. In the United States it was tested at the Missouri Botanical Garden, but it never was used as a commercial sort. The name was used by Tracy as a synonym of Caseknife, but that variety and the one here described differ greatly. It is still in use, especially in French Islands, Belgium, and Holland. Princess is a midseason variety, very productive, and most commonly used for the green shell and dry beans.

Princess differs from Predome in pods which are longer and with seeds more separate in the pods. The seeds when dry are larger and of a brighter whiteness. There is also a subvariety known as Long Podded Princess with seeds even more separated in the pods.

Plants about 6 feet tall, moderately vigorous, climbing well; foliage rather scanty, light yellowish green; leaflets small, wrinkled, thin. Flowers white. Pods green, 4 to $4\frac{1}{2}$ inches long, nearly straight, with long-rounded ends and short tips, not quite $\frac{1}{2}$ inch wide, sub-cylindrical, swollen over beans and constricted between them, without string or fiber but hardly fleshy enough for good snaps, green, slightly yellow near maturity. Seeds 6 or 7, sometimes more, not touching in pods, plump ovoid, about $\frac{3}{8}$ inch long, $\frac{1}{4}$ inch or more wide, very plump, with well rounded ends, white.

Princess Rose. Refs. 98. The only record of this bean is through a test at this Station in 1883 in which it was found to be a rather late, fairly productive variety suitable for use for the snap beans only.

Plant climbing, but only 3 feet tall, slender-stemmed and sparingly branched, with light green pods. Seeds small, nearly globular, very slightly longer than broad, occasionally slightly compressed on the ends, shining light reddish brown with brown eye-ring.

Purple Pod. Refs. 47, 93, 94. This variety was grown at the Missouri Botanical Garden and considered by Irish to be the French variety described previously as Blue Podded Pole; but his description of the purplish color of the foliage stems, leaf-stalks, and flowers, and the shape of the seed and its light color make it almost positive that Purple Pod is Martens' Lucas Bean, a newer sub-variety of the "Cosses Violettes" of Vilmorin and other French authorities, rather than the old variety which had been known in America since 1859. The Lucas bean was found in possession of a neighboring gardener by Dr. E. Lucas, Reutlingen, Germany, in 1863. Aside from the rather deeper violet color, beginning on the sunny side of nodes and extending to flower stalks, all parts of flowers, and to the pods as soon as they are well formed, which coloration makes the variety a curiosity, the Purple Pod or Lucas bean was no better than Blue Pod, although both varieties produce in late mid-season heavy crops of large, much swollen, fleshy pods, practically stringless and fiberless, and of good quality.

The seeds of Purple Pod are described by Irish as of "various shades of yellowish green, with dark ring around the hilum, more than $\frac{1}{2}$ inch long, irregularly flattened, often with truncated ends, slightly kidney-shaped;" while Martens gives color as flesh colored with gray veining, and shape $\frac{2}{3}$ inch long, more than half as wide, one-third as thick, flat kidney-shaped.

Queen of France. In France and Germany and at the Missouri Botanical Garden, this variety is a true pole bean, an excellent semi-late variety, very productive of pods practically free from string and fiber. The exact origin is unknown, but it has been grown in France for more than 50 years. There is some uncertainty as to whether a true dwarf form of Queen of France exists. Exceptional weather and soil conditions possibly account for the dwarfing of the plants grown at Geneva in 1889.

The pods resemble those of Zulu, long, heavy, semi-round, much swollen over beans and constricted between them; light green changing to light yellow and then white occasionally shaded with violet. Seeds in shape and markings are similar to very broad Dwarf Golden Carmines but with ashy gray or coffee brown ground color and black "Zebra" stripes.

Red Orleans. Refs. 13. Burr describes Red Orleans as quite prolific of pods, suitable for soups and stews.

Plant of medium height. Flowers white. Pods sickle shaped, about 5 inches long, tinged red as they mature and becoming yellow. Seeds 5 or 6, oblong, often squarely or diagonally truncate, $\frac{1}{2}$ inch long, three-fifths as wide, plump, bright blood red when harvested, soon becoming brownish red.

Rice. Refs. 32, 47, 56, 93, 94. Syn. Haricot Riz. Rice was grown at the Missouri Botanical Garden but seems not otherwise known in the United States, the Rice as described by Burr being a variety known as Dwarf White Rice, which variety was also grown by Irish. This bean was considered too tender for England except when grown next to a warm south wall for protection. In season it was late, although moderately productive and tender podded; its chief use is for the small white dry beans.

Plant 4 to 6 feet tall, climbing but rather weak-growing, allowing pods to touch the soil; thin, smooth leaflets, 2 to $2\frac{1}{4}$ inches by $1\frac{3}{4}$ to 2 inches. Pods 2 to 3 inches, sub-cylindrical, slightly curved, with short-curved tips, light green. Seeds 5 or 6, small, $\frac{1}{4}$ inch long or slightly more, nearly as broad, only slightly flattened, rounded or slightly truncate at ends, dingy, yellowish white.

Rocky Mountain. Refs. 46. A variety which appears to be known only by test at Geneva in 1890. The descriptions are very incomplete and without reference to its origin or time of introduction.

Plant 6 to 7 feet tall; very early in season. Foliage light green. Pods curved and very much wrinkled. Seeds $\frac{3}{4}$ inch long, smooth surfaced, dun colored.

Ronce-ray. Refs. 46. Vilmorin, in 1890, was the introducer of this variety which in its principal vegetative characters approaches rather closely Haricot Dwarf Soissons Vert. Whether or not it is a running type of the dwarf form is unknown. At first very popular it soon lost ground and was dropped from lists after about 15 years. In the trial at Geneva in 1891 it was considered of great merit as a snap bean, with broad pods of good length, produced over a long season.

Plant late, moderately productive. Pods $4\frac{1}{2}$ to 6 inches long, nearly $\frac{3}{4}$ inch wide, considerably flattened, straight or slightly curved, crisp when young, fibrous and stringy when old, green to maturity. Seeds 6 or 7, more than $\frac{1}{2}$ inch long, and more than half as wide, kidney-shaped, flattened, greenish white.

Royal Corn. Refs. 48, 91. Livingston introduced this variety in 1898 and carried it for more than

10 years, although only one or two other seedsmen listed it. The plant in growth habit was very similar to White Sickle, but earlier, more productive, and with flatter pods that were much curved or sometimes twisted; quality poor, stringy; seeds slightly shorter, broader, more kidney-shaped.

Scotia. Refs. 48, 58, 77, 91. Syns. Daisy Bell, Genuine Cornfield, Nancy Davis, Nancy Davis Cornfield, Striped Creaseback. The Scotia type of zebra-banded bean seed was known to Martens who had received seed from Louisiana through Duke Paul of Wurttemberg, and the type was also known to Savi who published a classification of beans in 1822. Scotia was first brought to general notice in this country in 1892 by Joseph Harris who had secured the seed from a customer in eastern New York who recommended the variety very highly. In the trials it proved to be a good late pole variety for either home or market use, the pods remaining in edible condition for a long period. The first pods were ready for picking in 72 days at Geneva. This was 10 days later than Kentucky Wonder, about the same time as Black-Seeded Kentucky Wonder, and a few days earlier than Cut Short and White Creaseback. Scotia is very similar in general growth habit and utility to Black-Seeded Kentucky Wonder, although since the pods are slightly stringy it is not quite as good in quality. The original strain as first introduced had pods which were stringless but this quality is lacking in most existing strains. The pods are similar in shape to pods of White Creaseback but differ in having purple coloring as they mature.

Plant large, $4\frac{1}{2}$ feet tall, with spread of two feet at base of plant; good climbing habit, compact growth, vigorous, very long in bearing, very heavily productive; stem heavy, thick, branches many, stems usually a reddish brown. Foliage abundant, dark green, smooth surface, slightly crumpled, medium in thickness; medium in size, 4 inches long by 3 inches wide, terminal leaflet rounded, side leaflets nearly triangular to broad ovate, taperpointed to short blunt tip. Flowers phlox purple.

Pods medium dark green, often shaded with purplish brown in later stages. Quality good; fairly brittle, fleshy, quite stringy, small amount of fiber and of very fine texture. Size long, narrow, and quite plump, ($6-7 \times \frac{1}{16} \times \frac{3}{8}$ inches), containing 8-9 seeds per pod. Shape round, nearly circular in cross-section, straight, crease backed, regular, fairly well crowded, filled to the tip and edge, and rounded at the end. Spur short, slender, and curved, occasionally recurved slightly. Suture, placental is slightly indented and carpellary, obtuse.

Seeds small to medium, $1.3 \times .7 \times .5$ cm., (100-105 per oz.) oblong to slightly sub-reniform, somewhat flattened, long oval in cross-section; ends rounded. Hilum medium, somewhat indented. Color grayish buff brown (tilleul-buff) under color, mottled with pinkish brown (light brownish vinaceous) over entire surface except for an occasional black stripe or two usually on the dorsal surface altho it may occur on the placental suture to some extent; prominent yellow drab narrow eye-ring always present.

Southern Prolific. Refs. 14, 15, 28, 36, 47, 48, 63, 79, 96, 97, 98. Syns. Haricot Don Carlos, Monster Podded Southern Prolific, Willing's Pride. Landreth listed Southern Prolific about 1872, but it was undoubtedly grown in the South before that date. According to Tracy, it originally bore short, fleshy pods of high quality, and was widely grown about 1880 and highly

prized. In France and Germany Southern Prolific was known as Don Carlos and considered a very vigorous grower with pods fleshy and very tender. Soon after 1900 the variety began to degenerate or similar seed of other varieties or strains became mixed with the true stock, so that at the beginning of this century it had become almost wholly of two types, both different from the old variety, and greatly inferior to it.

Plant large, good climber, thick stemmed, often purplish at nodes; foliage abundant, dark green; leaflets small to medium, smooth, thin. Flowers white. Pods, the old, valuable type had slightly curved pods about $4\frac{3}{4}$ or 5 inches long, very blunt-ended and with very short tips, decidedly oblate and indented on both ventrum and dorsum, so fleshy that only slight constrictions showed between the beans, brittle and excellent as snaps. The undesirable types were two,—one short-podded, of about the same length as the desirable type, but with more pointed ends and longer tips, thin-walled and much constricted between the beans, stringy and fibrous, of very poor quality; the second type had flat, very evenly curved pods, one-third to nearly one-half longer than the short-podded ones, with long-pointed ends and long tips, somewhat zig-zagged by swellings on opposite sides of pod over alternate beans, narrow oval in cross-section, not fleshy, stringy, fibrous and of poor quality.

Seeds small, about 135 to the ounce, short broad-oval, about $\frac{3}{8}$ inch long, very rarely $\frac{1}{2}$ inch, more than half as wide, with very short-rounded ends, not truncate, usually dark fawn changing to dark brown or burnt umber, without eye-ring.

Swiss Crimson. Refs. 13. Syns. Scarlet Swiss. Burr described this variety and seeds were exhibited before the Massachusetts Horticultural Society in 1864. The variety is no longer known but seems to have been a vigorous grower often listed with bush sorts. The plant produced runners and so was considered to have been a climber. It was grown chiefly as a greenshell variety, the large long beans at that stage being bright pink, striped and spotted deep purplish red, changing soon to dark purplish red and brown. Flowers lilac.

Tennessee Wonder. Refs. 48, 91. Syns. Brown Sickie, Holme's Improved Sickie. Landreth introduced Tennessee Wonder sometime before 1901. The type, however, is much older, for Martens described a variety, with figure, which is exceedingly similar, if not identical, and states further that the type was known to Savi. Martens had secured seed from Louisiana and from Chile which differed but little from the lot he described. Burr described a variety called Mottled Prolific which was similar in many ways but distinct from Martens' variety. The color of the pods, leaves, and stems is the same as for Scotia, but in other respects the varieties are different. The pods are larger and straighter than Kentucky Wonder pods, also later in season. It has been said that pods of Tennessee Wonder are the largest, straightest, and most handsome of all cultivated beans.

Plant rather small, slender stemmed, moderately branched, climbing well, with purplish shading on stems, branches, foliage and pods; leaflets quite large, almost as broad as long, more rounded than those of Kentucky Wonder. Flowers pink.

Pods light green in color. Quality fair to good; brittle, tender, nearly stringless and fiberless but coarse in texture. Size long, moderately broad and plump ($6-8 \times \frac{5}{8}$ inches) and containing 8-9 seeds per pod. Shape round, very broad, oval to double-barrelled in cross-section, deeply creasebacked, moderately scimitar shaped, much constricted, not crowded, rough surfaced, filled to the

tip and edge and pointed on the end. Spur long, moderately stout and curved. Suture, both placental and carpellary are rather deeply indented.

Seeds medium to large, $1.7 \times .65 \times .55$ cm. (65-70 per oz.); long reniform, plump, occasionally slightly twisted; ends rounded. Hilum medium, indented. Color quite similar to Scotia although it is a somewhat darker combination of (mouse gray) and (pale pinkish buff) blended into a very fine mottling over the entire surface. It is marked with long and curved streaks of dull black, usually on the hilar and dorsal surfaces although occasionally on the sides as well, and a moderately broad, black eye-ring. As the seed ages, the gray is very largely displaced by a dull tawny (russet) color.

Thuringen. Refs. 28, 47. Syns. Grand Sword Giant, Japan Giant Butter. This variety was tested at the Missouri Botanical Garden in 1900 but was not grown commercially in America. It was apparently well known and was described in France but little grown as the beauty of its pods was not enough to counter-balance rather poor yields and lateness. In Germany it was said to be fairly early and very productive.

Plant a low climber, with light pink blossoms. Pods medium to long, straight, broad, flat but fleshy, short tipped, only slightly swollen by beans, brittle, tender, stringless, fiberless, light green slowly yellowing, handsome. Seeds very large, very broad, very flat with straight eye-side or rarely approaching kidney-shape, yellowish brown becoming light maroon.

Transylvanian Butter. Refs. 63, 97. This bean was grown at the Geneva Station in 1882 and also in the trials at Kansas in 1889. Gregory secured seed from Germany and introduced the variety to American growers in 1885. It never became a popular sort and was soon dropped from the lists. The chief objection to the variety was its extreme lateness, for unless the season was long the plants were unproductive.

Plant low-growing; foliage quite abundant, dark green, with small obovate or triangular, short-pointed leaflets. Flowers purplish. Pods short, $3\frac{1}{2}$ to 4 inches, very broad, straight or nearly so, almost blunt-ended, with very short, straight dorsal tips, much swollen by seeds, dark green almost entirely covered with dark purple stripes, edible as snaps only in early stages, soon much wrinkled, stringy and fibrous. Seeds 6 or 7, very broad oval, ovate from edge, short-rounded or truncate ends, nearly $\frac{1}{2}$ inch long, three-fourths as wide, more than half as thick, pale dirty blue shading to bluish dun. (In Kansas test Cranberry shape, greenish white, when young, clay yellow varying darker when ripe.)

True Asparagus. Several "asparagus" beans are known, the name being generally applied to Yard Long, a bean belonging to *Vigna sineusis sesquipedalis*, of a different genus from the common garden beans. The variety here described is grown in the Northwest, but was tested here and seems distinct from others, though somewhat like Kentucky Wonder, to which the name Asparagus Bean is also sometimes given. Thorburn in 1899 offered a variety called French Asparagus producing round pods from 8 to 12 inches long. This was not the same as the variety known today as French Yard Long.

Plant and foliage quite similar to those of Kentucky Wonder, but leaflets rather longer due to longer, often curved, rather acute tips. Pods broad oval, more slender than those of the compared variety, shorter with us but very long under favorable conditions, rather longer tipped, well filled, tender, fleshy, with slight string only, fiberless, fine-textured, of good quality. Seeds 7 or 8, much like those of Kentucky Wonder but more drab than brown.

Virginia Cornfield. Refs. 91. T. W. Wood & Sons in 1905 were the first to list this variety, but the casualness of the introduction and the meager description indicate an old variety rather than an origination. During the next 10 years it attained some popularity, but about 1915 it began to lose its position since it was too late for the North, too slender-podded, too tough, and too stringy for snaps and too small-seeded for green-shell beans. In the South it is grown among corn for a dry-shell bean, the white seeds being more acceptable for this purpose than the colored ones of many other pole beans. It somewhat resembles Missouri Wonder and Royal Corn in general character and usefulness, but is later and has smaller pods. Like Georgia Pole and Powell's Prolific, it is very late, but also, with these varieties, it represents a group that makes the largest growth of any other pole varieties.

Plants large, good climbers, heavy-stemmed, much branched, very productive. Pods nearly 7 inches long, curved, flat, tough, stringy, fibrous, green occasionally marked purplish. Seeds 8 or 9, about $\frac{1}{2}$ inch long, half as wide, oblong or slightly kidney-shaped, fairly plump, occasionally compressed on ends, white.

Ward Prolific. This variety was introduced by the Grand Junction Seed Company in 1925. It is a very late, very productive, small-podded variety, with pods of beautiful appearance, that are edible within 80 to 85 days. The plants and pods resemble those of Scotia in many ways but are distinct showing less red throughout, the foliage is more dense, more compact, the leaflets are larger, less crumpled, and pods are edible nearly 10 days later. The seed is black, more like Black Creaseback or Ideal Market.

Plant tall, $4\frac{1}{2}$ feet and more with spread of $2\frac{1}{2}$ feet at base, a good climber with rather dense compact growth; very vigorous, productive; stout stemmed, many branches, showing some red on stems but not as much as Scotia. Foliage very abundant, dark green; surface smooth, slightly crumpled, glossy, pubescent, thin; leaflets large. Flowers rose purple.

Pods medium green in the snap stage but later becoming speckled with pinkish to purplish markings. Quality poor; stringy, quite fleshy, tough, fibrous and coarse in texture. Size medium long, rather narrow and quite plump, ($4\frac{1}{2}$ - $5\frac{1}{2}$ x $\frac{3}{8}$ - $\frac{7}{16}$ x $\frac{3}{8}$ inches), containing 8-9 seeds per pod. Shape round, nearly circular to broad cordate in cross-section, slightly but quite uniformly curved, straight backed to slightly crease backed, regular, very crowded, smooth, filled to the tip and edge and abruptly rounded to truncate at the end. Spur short, thick and straight. Suture, placental is flat to slightly indented and carpellary, rounded to obtuse.

Seeds small, 1.0 x .6 x .45 cm., (145-150 per oz.); inclined to be somewhat rhomboidal, short, quite plump; ends distinctly truncate. Hilum medium, flat to slightly indented. Color very dull, cloudy black over the entire surface.

White Asparagus. Refs. 47. This bean was described at the Missouri Botanical Garden in 1901, but does not appear to have been grown elsewhere in this country. The variety is apparently of German origin but has been grown in France and described by both Vilmorin and Denaiffe as Quatre-a-quatre. The plant may be described as a short-vined Lazy Wife, with finer foliage, somewhat flatter pods, and larger seeds. Denaiffe also describes separately an "Asperge" bean, also from Germany, which differs from Quatre-a-quatre, mainly in having somewhat taller vines and

larger seeds. The two French varieties are probably only strains from an old German stock. Seed, dingy white.

White Cranberry. Refs. 13, 28, 94, 98. White Cranberry was known in America as early as 1828 and was quite popular for a long time, for its white, green-shell beans. Sophie, Lazy Wife, and White Cranberry are names which have been represented in catalogs for more than a century. Of the three, Lazy Wife alone continues to be listed in current catalogs. There is no clear demarkation between these varieties. Denaiffe gives White Cranberry as a synonym of Coco Blanc which, according to his description, is identical with Lazy Wife. Vilmorin considers Sophie a strain of Coco Blanc, while Wing described Sophie as either the predecessor of Lazy Wife or its European form. By some White Cranberry was known by a few characters markedly different from other types, it being decidedly more stocky, with broader pods, wider from stem to tip, and with marked carmine or purplish shadings typical of the horticultural varieties, and also with seeds slightly longer in proportion than those of Sophie.

White-Seeded Butter. Refs. 48, 52. Dallwig introduced this variety from Europe prior to 1901. It was quite similar to Burger Stringless, but with larger pods which were less round, straighter, decidedly stringy, and with seeds which were distinctly larger.

White Sickie. Refs. 48, 91. Syns. White Wonder. This is another of the so-called corn field varieties grown in the South for many years before it was introduced by Richard Frotscher Co. in 1882. White Sickie is more like Royal Corn than any other variety, differing from it in later season and lower productivity. It also resembles Kentucky Wonder but has larger and later vine with pods longer, straighter, more crease backed, and a deeper green in color. The variety was listed in 1921 by only two seedsmen, from one of which we obtained seed. The variety proved to be one of the Cornfield Pole beans, so the description is not our own but is shortened from those given by Tracy and Jarvis.

Plant very tall growing, and holding fairly well to supports, very late, fairly to very productive in South. Pods most slender of any of Burger Stringless group, 9 inches or more long, nearly or quite straight near stem, but much curved toward tips, frequently twisted, round, much creased on both dorsum and ventrum, much swollen by beans and constricted in rather long separatory spaces between them, along all outlines wavy, more or less zigzag, tips longer than those of others in group, not very fleshy, but stringless, fiberless and fine grained, rough-surfaced, dark green. Seeds 8 or 9, nearly $\frac{5}{8}$ inches long, decidedly less than half as wide, elliptical in outline, flattened, often distorted, somewhat wrinkled, creamy white.

White Soissons. Refs. 13, 47, 52, 56, 93, 94, 98. Soissons has been referred to under Caseknife, which it resembles but from which it is separable by its larger, broader seeds and the comparatively narrower, more constricted, wrinkled pods. According to Bois, it was first mentioned by De Combles in 1749, one of the very early dates in the history of distinct varieties of beans. It is said to have been grown near Soissons for 200 years.

It is too late for maturity in Central France, but farther south, and in favorable conditions elsewhere, it is highly esteemed for the size and beauty of the green beans, as well as for a peculiarly pleasing flavor which develops only under the best conditions. It was listed and described in America several times during the two decades or more after 1860, but probably little grown.

Wild Goose. Refs. 13. A variety that has been known and grown in Europe and America perhaps more as a novelty than as a commercial sort. The large fat pods are hardly suitable for market use but are fair in quality when young. The shell beans are excellent either as green or dry shell.

Plant tall, 7 to 8 feet, vigorous, good climber, rather open growth particularly above the base of plant; foliage medium abundant, dark green, leaves crumpled, somewhat rough, medium heavy veining, medium thick. Flowers rose purple.

Pods pale green when young, turning to cream yellow streaked and marked with light purple in green shell stage. Quality fair; not very fleshy, stringless, quite fiberless, and medium in texture. Size short to medium, broad and slender, ($4-5 \times \frac{5}{8} \times \frac{1}{2}$ inches), containing 5-6 seeds per pod. Shape flat, long ovate in cross-section, straight although occasionally scimitar-shaped, straight backed, constricted, not crowded, smooth, filled to the edge but not to the tip and square to truncate on the end. Spur medium long, thick and slightly curved. Suture, placental is flat and carpelary, acute.

Seeds large, $1.4 \times 1 \times .6$ cm., (45-50 per oz.); very broad, short oval, fairly plump to somewhat flattened, long oval thru cross-section; ends rounded but inclined to be wedge-like to some extent. Hilum small, flattened. Color buff (pale pinkish buff), splashed and spotted over the entire surface with deep purple which in older seed becomes black, marked with a narrow yellowish buff eye-ring.

Woodward. Ref. 4. Gregory included Woodward in his list of varieties in 1885. His description stated that this bean was among the "select varieties of former years." From the brief description given it appears to differ from Jordan Self-drier only in having pure white, rather than ivory-white seeds; as it also is late, healthy, vigorous, productive, very tender-podded, and with seeds "round as bullets." These similarities place Woodward as a strain or selection from Lazy Wife rather than as a distinct variety.

Yellow Cranberry. Refs. 13, 49. Seed of this variety were part of the collection of 100 different kinds of bean seed exhibited before the Massachusetts Horticultural Society in 1864. Burr listed the variety in 1863, commenting favorably on the productivity of the plant and quality of the pods. It was late for the type, two weeks later than Red Cranberry and a few days later than White Cranberry, producing edible pods in 10 weeks and edible beans about 18 days later. It was hardy and productive, of good quality as string or green shell beans, and the dry beans were equal to White Marrow for baking, although not as good color.

Plant of medium height, 5 to 6 feet; foliage yellowish green. Pods $5\frac{1}{2}$ inches long, often "sickle-shaped," $\frac{3}{4}$ inch broad, pale green, later becoming cream yellow, shrivelled and irregular. Seeds round-ovoid, $\frac{1}{2}$ inch long, three-fourths as wide, and as thick, yellow with narrow dark eye-ring.

Zebra. This is the French representative of Scotia-type beans, raised by Mons. Perrier of France

about the middle of the past century. It was noticed in the United States in 1856, grown by Irish about 1900, and has been listed in England and Australia.

Vines tall, very vigorous, with abundant dark grayish green foliage, flowers light lilac. Pods short, fleshy, round (Irish says wide, "Much flattened"), slightly curved, practically stringless and fiberless, and of very good quality. Seeds like those of Scotia, but larger, distinctly ovoid and very plump.

WAX PODS

Algiers. Refs. 98. This name is usually found in connection with a strain of German Black Wax or Indian Chief. In France it is known as D'Alger Noir a Rames and as such is considered a synonym of the varieties mentioned above. At Geneva in 1884 the plants grown as Algiers proved to be entirely unlike D'Alger Noir, differing in some ways from any other variety in the trial.

Plant slender, moderately tall; pods very broad, much wrinkled. Seeds large, 75 to the ounce, oblong, very broad, strongly flattened sidewise, often transversely bent by the wrinkling of the pod, jet black, shining.

American Wax. Refs. 28, 47. A variety that is quite similar to Black Scimitar, very late in season. It was described by Irish but is unknown in present day listings.

Plant rather small; leaflets light green, small, thick, crumpled, wrinkled. Flowers purple. Pods shorter than those of Black Scimitar or White Zulu, 4 to 6 inches long, much more curved, broad, flat, with proportionately longer, slender, curved tips, greenish yellow (strongly striped or tinted violet,—Denaiffe). Seeds like those of Black Scimitar, but more irregular, dull, not shining, black or dull brown.

Andalusia. Refs. 45, 48, 63, 79, 91. Syns. Golden Andalusia, Golden Lazy Wife. Johnson & Stokes secured seed of this variety from a bean grower at Andalusia, Pa., gave it the name of the town and introduced it in their catalog of 1888. Andalusia, or Golden Lazy Wife, was a midseason variety, very productive, and only slightly affected by disease. It was fairly popular for a time, being listed by about 25 firms in 1901; but has now disappeared from catalogs. In many of its characteristics it closely resembles Indian Chief, but is nearly a week later and has pods that are shorter, much more curved, deeper yellow, and with a longer spur.

Moore's New Golden Lazy Wife, introduced in 1923, is evidently only a small-podded, small-seeded type of Golden Cluster.

Plant large, well branched, climbing well when fully established, with light-colored, thick stems; foliage light green. Pods medium size, about 5 inches long, much curved, rather flat at best snap stage, later becoming almost round, plump, somewhat swollen over beans and constricted between them, with short-rounded or almost blunt ends and rather short, straight central tips, clear rich yellow. Seeds 6 or 7 crowded in pods, less spherical than those of Lazy Wife, nearly as wide as long, but somewhat flattened, distinctly ovate in longitudinal section, with well rounded eyes, white.

Baldwin Wonder Wax. Refs. 65. Syns. Kidney Shaped Wax Pole. This is a pole bean introduced in 1915 by D. M. Ferry from seed secured from a Mr. Baldwin of West Virginia. The young pods are long, cylindrical, of a clear waxy white, very small, and string-

less. As they mature they resemble pods of Kentucky Wonder Wax but are more slender and a week later in season. The seed resembles seed of Dwarf Kidney Wax in size and shape.

Plants like those of Golden Cluster. Pods differ only in slightly greater length and slightly less width with greater thickness, all tending to make them appear more slender, of equally good color and quality. They also show slight, very long S-curve. Seeds small, about 125 to the ounce, about $\frac{3}{8}$ inch long, or slightly more, about one-half as wide, long oblong or slightly kidney-shaped, with short-rounded ends, narrow oval in cross-section, with markings like Horticultural beans, but duller,—background putty colored, and markings brownish.

Black German. Refs. 15, 48. Plant, foliage, and flowers of Black German and Indian Chief are indistinguishable and the history and description are given under the latter as the better known of the two. The pods of Black German are straighter, broader, flatter, with a less well-defined point and are more depressed between the beans, which are shorter, more nearly globose, more regular and deep, shining black.

Broad Wax. Gregory listed this variety in 1885 among the select varieties of recent years. The pods were enormously broad and long, exceeding in size any pole bean cultivated; which seems to be confirmed by compared figures of Broad Wax and Giant Wax. Nothing has been found regarding the history of the variety, although it seems similar in most respects to one of the sub-varieties of Intestin of which the pods are light green becoming yellow toward maturity and much thicker than wide, a marked characteristic of Broad Wax (properly "Thick" Wax). Gregory credits the variety with extreme earliness for a pole bean, but the Intestin varieties are midseason or late. From appearance of pod, the seeds are evidently thick, broad ovoid, and from general resemblance to Intestin, probably white. It is a string and green-shell bean, early and fairly productive.

California. Refs. 90. According to Burr, who did not mention the California in his original treatise on vegetables, its true name and origination are unknown, the common name being given in accordance with a custom then quite common in the east of calling "California" any new fruit, flower, or vegetable originally received from that state. The variety was grown to quite an extent on the Pacific Coast of South America, in some parts of California, and in the Sandwich Islands. It was early, pods being ready for use in 9 weeks from May 20th, and seeds ripe in 3 weeks more; hardy, productive, holding over long season, much used for string beans, but most valued for the green shell beans which are of excellent quality.

Plant healthy, vigorous, 6 feet tall or more; flowers white. Pods long, broad, flat, green, changing to cream yellow. Seeds 6 to 8, kidney-shaped, $\frac{5}{8}$ inch long, $\frac{3}{8}$ inch wide, clear ochre-yellow.

Fillbasket Wax. Refs. 28, 47, 52. Syns. Wax Case Knife. There are two strains of pole beans with this name, one of which originated in Germany shortly before 1899 and was grown in the Missouri Botanical Garden tests, but otherwise seems unknown in America. Irish called it Wax Case Knife, and described it as identical with Caseknife except that the pods are waxy

yellow. The other strain is green podded and was described by Denaiffe as a sub-variety of Case Knife, much shorter in vine with longer and narrower pods and longer seeds. This green podded Fillbasket was also grown and described in the trials of the Royal Horticultural Society in 1918. There is also a dwarf sort called Fillbasket Wax.

Flageolet Wax. Refs. 90. This bean is said to be of German origin, although the name is French. The Flageolet Beurre a Rames, however, which should be this variety and apparently corresponds to it in many ways, is described by Denaiffe as very stringy and fibrous except in very early stages, which is entirely different from the character given it in America.

Plant early, very productive, with pods in clusters, borne close to ground, $7\frac{1}{2}$ to 8 inches long, round, full, fleshy, stringless, rich golden yellow, "most half-transparent look of any bean." Seeds large, long kidney-shaped, reddish brown.

Giant Red. Refs. 45, 63, 66, 97, 98. This is not the same as the Runner bean commonly known in England as Red Giant but is an American variety said to have been introduced to Philadelphia growers in 1866. As grown at Geneva in 1882 it was much later than Indian Chief and less productive. Burr in 1862 did not mention it nor did Irish have it in his trials. The pods were not of the highest quality for use as string beans but were excellent for green shells.

Vines large, leaves abundant, broad oval, slightly heart-shaped, obtuse-tipped. Flowers large, white. Pods 7-8 inches long, straight or slightly curved, broad, flat, much swollen by beans; irregular, fleshy, succulent and tender, rather coarse-textured, yellow, which color remains on cooking. Seeds 5 or 6, sometimes 8, broad oval, slightly longer, not quite as plump as those of Indian Queens, dark reddish brown.

Golden Champion. Refs. 47, 48, 59, 91. Henderson, the introducer of this variety, procured seed from Germany in 1890, the first listing occurring in his 1891 catalog. It was commended in a test at the Kansas Station in 1891 because of its earliness and productivity; but by 1901, when tested at the Missouri Botanical Garden, it had either deteriorated or untrue stock had been secured, as it was very short-podded.

Pods long, slender, round, whitish yellow, smooth surfaced, somewhat tough and stringy and of only fair quality. Seeds were most typically kidney shaped, slender, and longest of any black-seeded wax bean.

Golden Cluster. Refs. 10, 14, 15, 29, 36, 48, 52, 59, 63, 66, 67, 68, 77, 79, 84, 85, 91. Syns. White Algerian, Early Golden Cluster Wax. In America, Golden Cluster was introduced in 1806 by Henry A. Dreer as Early Golden Cluster Wax Pole. Seed had been procured from John Kramer of Doylestown, Pa., who had originally procured stocks from Germany. Golden Cluster was known to Martens, at least as a type, and under the name White Algerian it was grown in the Geneva trials in 1882. This White Algerian strain, both at the Missouri Botanical Garden and in early tests here, appeared shorter podded as compared with Martens' description and figure or with some stocks of Golden Cluster as grown in recent Geneva tests. The popularity of Golden Cluster Wax has



EARLY STRINGLESS WAX

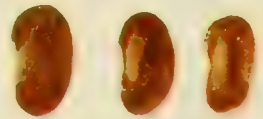
Natural size.



KENTUCKY WONDER WAX



GOLDEN POD



GOLDEN LAZY WIFE



GOLDEN CLUSTER WAX



gradually receded, while that of Kentucky Wax has ascended. The variety still is capable of producing attractive, flat, nearly straight, fleshy pods. It is most suitable as a snap pod bean, but can also be used as a green shell and dry seed bean. The first pods were pickable in 74 days at Geneva or about 7 days later than Kentucky Wonder Wax. While in many ways like Kentucky Wonder Wax, the seeds are a dull white instead of maroon to chocolate brown, the pods are shorter, straighter, wider, flatter, but have the same pinkish coloring at green shell stage, the vines are larger and more vigorous. In general utility and quality it stands next to Golden Carmine-Podded Horticultural. Golden Wax also resembles Sunshine Wax, an old variety introduced by Burpee in 1890. Sunshine, however, has very plump, oval, reddish brown seeds.

Plant large, $4\frac{1}{2}$ feet tall and more, spread at base $1\frac{3}{4}$ feet, good climbing habit, dense growth thruout, very vigorous, hardy, productive over moderate producing period; thick, heavy stemmed, yellowish green color, moderately branched, wholly green. Foliage abundant, light to bright green; leaf surface smooth to slightly crumpled, slight pubescence, medium in thickness; leaflets large, broad, $4\frac{1}{4}$ to $4\frac{5}{8}$ inches long, $3\frac{3}{4}$ to $4\frac{1}{2}$ inches wide; terminal leaf bi-symmetrical, evenly and well rounded from widest point (one-fourth the distance from base) to stem; lateral leaflets decidedly one-sided; both taper nearly straight to short obtuse tips. Flowers white.

Pods clear, light, very waxy yellow in color. Quality excellent, brittle, tender, stringless, fiberless and of fairly fine texture. Size fairly long, broad and medium slender to plump, ($5-7 \times \frac{5}{8}-\frac{3}{4} \times \frac{3}{8}$ inches), containing 7-8 seeds per pod. Shape flat, ovate-acuminate in cross-section, slightly curved, straight backed, regular to somewhat constricted, not crowded, quite smooth, filled to the tip but not to the edge, and rounded to tapering at the end. Spur short, medium thick and rigidly straight. Suture, placental irregularly rounded and slightly indented while carpellary is moderately acute.

Seeds medium to large $1.4 \times .85 \times .5$ cm., (70 per oz.), broad oval, decidedly flattened, often irregular in thickness like those of Caseknife; abruptly rounded to truncate ends. Hilum medium, flat. Color dull white thru which shows grayish-vein-like markings over the entire surface.

Hungarian Butter. Refs. 63. There seems to be little recorded in English writings of the bean varieties that might be found in countries other than France, England, and Germany. The origin of Hungarian Butter is attributed to southeastern Europe, Gregory introducing the variety in 1890. The Kansas Station in trials the same year found the plant to be a weak, slender climber with small to medium, broad, obtusely tipped leaflets. The pods were in length about like Golden Cluster, in shape like Kentucky Wonder Wax, almost round or angular, fleshy, and quite stringless, and the seeds 4 to 8, very similar to those of the Kentucky Wonder Wax, but rather lighter in color, brownish dun and with a dark eye-ring which was black in the green beans.

Indian Chief. Refs. 12, 13, 47, 48, 56, 91, 93, 94, 97, 98. Syns. Algiers, Algerian Wax Pole, Black Algerian Wax Pole, Black Wax Pole, German Black Wax Pole, Tall German Black Wax Pole. Two black-seeded wax pole beans have been known in America for three-quarters of a century, so similar in most respects that separation was difficult even with pure stocks of

both. Considering the exchanges of synonyms, mixtures of seeds, merging of types, and practical disappearance from catalogs of the oldest common name of one type, writers on beans, past or present, are quite excusable for considering the two as one. Early records taken at Geneva show that while German Wax, Black Wax, and Indian Chief were very nearly identical, yet German Wax was a much later variety in edible pods as well as dry seeds. Black Wax seems to be intermediate in characters in comparison with the other varieties.

One of these strains was undoubtedly the first wax-podded bean known in Germany early in the second quarter of the last century. Denaiffe describes under a French name and as a sub-variety of Indian Chief, Alger Noir a Rames, a German variety which seems identical with Black German and which is probably the one included by Wing under German synonyms of that variety. Martens placed most of the synonyms belonging to these varieties under *Phaseolus sphaericus niger*.

It is said to have come to Europe from China in 1837, to France in 1840, and to the United States about 1852. It is chiefly valuable for the attractive, waxy-yellow, stringless pods, suitable as snap pods or green shells. In season late, not always certain to mature in the North. Therefore, it has been generally succeeded by earlier, larger, and more attractive podded types, such as Golden Cluster Wax, Kentucky Wonder Wax, or Golden Carmine-Podded Horticultural.

Plant large, climbing well after rather slow start, moderately compact, vigorous, moderately productive of long bearing period; heavy stemmed, many branches usually tinged reddish near nodes. Foliage medium abundant, medium to grayish green; leaf surface smooth, flat; leaflets rather narrow, medium size, long pointed. Flowers lilac.

Pods deep rich yellow in color. Quality very good; brittle, tender, nearly stringless, fiberless and fine in texture. Size medium long, moderately broad, and fairly plump, ($5\frac{1}{2}-6 \times \frac{5}{8} \times \frac{1}{2}$ inches), containing 5-7 seeds per pod. Shape flat, oval in cross-section, moderately to much curved, very slightly crease-backed, slightly constricted, not crowded, smooth, filled to the tip and edge and rounded to somewhat tapering at the end. Spur short, thick and curved. Suture, placental is slightly indented and carpellary, obtuse.

Seeds medium, $1.1 \times .85 \times .6$ cm., (80 per oz.), short, broad oval to oblong oval, broad oval thru cross-section, plump; ends abruptly rounded to somewhat flattened suggesting an angular or irregular general shape. Hilum small, protuberant. Color dull black with a bluish tinge which is quite evident.

Ivory-Pod Wax. Refs. 63. This bean is known to us only through a test at the Kansas Station in 1889.

Plant low, slender runner, with small, light green leaflets. Flowers white. Pods abundant, 3 to $4\frac{1}{2}$ inches long, curved, ivory white. Seeds 4 to 6, oblong oval, often truncate, often irregular and shrunken, polished veiny white.

Kentucky Wonder Wax. Refs. 4, 48, 77, 91. Syns. Ohio Wax Pole, Schwill's Wonderful Wax Pole, Prosperity Wax Pole, Texas Prolific Wax, Old Homestead Wax, Golden Pod Kentucky Wax. What was evidently a precursor of this variety was listed in 1889 as Ivory Pod Wax Kentucky, but Tracy and Jarvis say that Kentucky Wonder Wax was introduced in 1901 by Johnson & Musser. A later catalog of that firm's

successors says that the variety was noticed by them in 1898 in the garden of Miss Callahan, Los Angeles, Calif., and offered in 1899 in small quantities. No earlier record of how or where this most popular wax-podded pole bean originated can be found. The pods are suitable for either snap pods or green shell beans. After 30 years trial it is now the most popular of the wax-podded pole varieties. Many name variations and synonyms have been used for Kentucky Wonder Wax which is evidence of its widespread use. In season it is an early variety, 68 days, or one week earlier than Golden Cluster Wax. The pods resemble those of Golden Cluster but are longer, narrower, shorter-pointed, earlier, but less hardy and vigorous; the seed is colored instead of white. The pods are not as much curved and distorted as those of the green-podded Kentucky Wonder but are more curved and less regular than Golden Cluster.

Plant small to medium, growth about $4\frac{1}{2}$ feet tall with spread of $1\frac{1}{2}$ feet at the base, a good climber but open in growth; only fairly vigorous, short in bearing period, productive; slender stemmed, rather sparingly branched, yellowish green often with reddish tinge near nodes. Foliage scanty to medium abundant, medium to dull dark green; leaf surface crumpled, slightly rough, slightly pubescent; leaflets large, $4\frac{1}{8}$ to $4\frac{7}{8}$ inches long for terminals, 4 to $4\frac{1}{4}$ inches wide at about one-fourth the distance from the base of leaf, slightly heart shaped at stem, distinctly longer and proportionately narrower for the one-seeded laterals, margins well rounded at widest point and straight or slightly incurved to tapering tips. Flowers white.

Pods light yellow in color. Quality good; very brittle, moderately stringy, not exceedingly fibrous, fleshy, and of moderately coarse texture. Size long, medium broad and moderately plump ($6-8 \times \frac{1}{2} \times \frac{3}{8}-\frac{5}{8}$ inches), containing 6-8 seeds per pod. Shape flat at first, becoming broad ovate and finally quite square in cross-section, curved, not as much as Kentucky Wonder, but more so than Golden Cluster, occasionally S-shaped, crease backed, constricted, not crowded, smooth, filled to the tip and fairly well to the edge, and rounded to tapering on the end. Spur short, thick and straight. Suture, placental is slightly indented, and carpellary, obtuse.

Seeds large, $1.6 \times .9 \times .6$ cm. (80 per oz.), broad oval to subreniform, long oval thru cross-section, somewhat flattened, seed coat inclined to be wrinkled; ends abruptly rounded and often truncate. Hilum medium, indented. Color shining seal to chocolate brown (burnt umber) over entire surface.

Mastiff Golden-Pod. This variety, the largest podded of the pole beans, was introduced by Johnson & Stokes in 1892. The variety, in spite of its good points, apparently disappeared in a decade, as it was not listed in the catalogs of 1901. While late, it was very productive and with pods of good quality.

Plant tall, vigorous, climbing well; foliage rather scanty medium to light green; leaflets of medium size, short, broad. Pods much like those of Golden Cluster, often long, with long rounded ends, and very short dorsal tips; very fleshy, nearly round as beans enlarge, light waxy yellow, "of rich buttery flavor. Seeds about 6, apparently quite large, short oval, plump, light yellow.

Mont D'Or Pole. Refs. 28, 47, 48, 51, 52, 91, 93, 94, 97, 98. Syns. Golden Butter. This variety, as its name foretells, is a French sort which originated near Lyons sometime before 1874 when its merits were noted in an English horticultural periodical. According to French records, the variety spread rapidly, being grown and much appreciated in Germany which prob-

ably led to earlier statements that the variety originally came from there. Just when or by whom it was brought to America is uncertain, but it has been listed by seedsmen at least since 1883 when it was cataloged by Gregory. It is a later wax-podded variety suited for home use but not as a market variety as the pod color is poor when cooked. It is late in season, although somewhat earlier than Indian Chief. The pods are flatter and straighter than pods of Indian Chief. In some respects they resemble pods of some of the bush wax-podded varieties, such as Curries, the pods of which do not become rounded out at the green-shell stage as do pods of Indian Chief.

Plant, at Geneva this variety has shown rather poor growth, not over $3\frac{1}{2}$ feet tall, climbing weakly; vigor poor, open growth, slow to start climbing; late, rather unproductive; slender stemmed, few branches, slightly reddish tinged. Foliage scanty, light green, surface somewhat crumpled, slightly rough, thick; leaflets small $2\frac{1}{2}$ inches long, 2 inches wide; widest one-fourth the distance from the base, well rounded to stem, terminal leaf bi-symmetrical, side leaflets one-sided but rounded, tips short pointed. Flowers Phlox Pink.

Pods uniformly light clear yellow in color. Quality excellent; stringless, entirely fiberless, brittle, tender and fine in texture. Size moderately long, quite broad, and slender, $5\frac{1}{4}-6 \times \frac{1}{8} \times \frac{5}{8}$ inches), containing 5-6 seeds per pod. Shape flat, oval in cross-section, moderately straight, straight backed, regular to slightly constricted, not crowded, very smooth, filled to the tip and edge and distinctly rounded at the end. Spur short, moderately stout and straight. Suture, placental flattened and carpellary, acute to moderately obtuse.

Seeds medium, $1.25 \times .8 \times .7$ cm., (70-75 per oz.), short, broad oval, very plump, nearly circular in cross-section; ends uniformly but abruptly rounded. Hilum small, flattened. Color reddish brown (liver brown) under color quite uniformly mottled and spotted with very dark almost blackish brown over entire surface, occasionally blotched solidly over a small area on the ends or dorsal surface with the same shade. Fresh seeds occasionally have all or part of the surface blotched with purple (blackish purple).

Queen. Refs. 47. Irish included Queen in his list and there seems to be no other indication of its rise in America. It is evidently of German origin, but no longer listed in either Germany or France. According to Irish, it differed from Indian Chief only in the seeds which were nearly globular, like those of Black German, but larger than those of Indian Chief.

St. Fiacre. Refs. 52, 65. This is a French variety which was introduced by Vilmorin in 1893 and brought to America about 1914, nearly 20 years later, by Farquhar. Productive of long, fleshy, beautiful white pods but evidently too late in season to gain a place in America.

Plant very tall, vigorous, climbing well, quite resistant to disease, with abundant, flat, smooth, very light green foliage. Flowers white or pale lilac. Pods $6\frac{1}{2}$ to $7\frac{3}{4}$ inches long, $\frac{3}{8}$ to nearly $\frac{3}{4}$ inch wide, with heavy profile, almost round and swollen over beans, very fleshy, stringless and fiberless. Seeds 7 to 8, elongated kidney-shape, broad, considerably flattened, $\frac{5}{8}$ to nearly $\frac{3}{4}$ inch long, not quite half as wide, rather more than one-third as thick, grayish coffee brown.

Sunshine Wax. Refs. 48, 91. Syns. Red Sissons. Burpee in 1890 introduced this variety to the American trade. Some growers on Long Island were said to have had seed and grown the beans since 1887. Originally it was said to have come from France where it was known as Red Sissons. In the trials at Geneva in 1890

and at the Michigan Station it was held to be identical with Golden Cluster except for the reddish brown color of the seeds which were very broad and plump.

White Zulu. Refs. 47, 59, 67, 85. This variety was grown to a limited extent for a decade or so after 1888, when it was introduced by Burpee. It is merely a slight variation of Black Scimitar with greenish yellow pods which later become almost white with a faint violet shading and which are broader and more fleshy than the original.

Yellow-Podded White. Refs. 97, 98. This variety was introduced by Gregory in 1882 and was grown at Geneva the same year. It did not do well in the Station tests, but Gregory says its pods were as long as those of Giant Wax and that it exceeded the variety in earliness and productivity.

Plant low climbing. Flowers white. Pods $5\frac{3}{4}$ to $6\frac{3}{4}$ inches long, rather flat, curved, somewhat swollen by beans, yellow. Seeds oblong kidney-shaped, strongly flattened sidewise, sometimes slightly compressed at ends, $\frac{5}{8}$ inch long, half as wide, hardly one-third as thick, white, veiny.

THE DWARF VARIETIES OF GARDEN BEANS

The dwarf varieties of garden beans are further divided into the green pods and wax pods. The color of the pod seems to be the only clear separatory character to use for a grouping of the varieties in this section. The next natural division would be into flat pods and round pods, but there are many varieties with pods that are intermediate between flat and round and some with pods which appear flat when small but which are quite round as the seed develops.

This group, so far as the habit of growth and plant characters are concerned, could also include those varieties found in the section on horticultural and field beans. However, they have been separated here in a general way according to the method of using, either snap beans, shell beans, or dry beans. The dwarf varieties of garden beans, as here considered, are those varieties grown for the pods which are cooked when young or at the stage of maturity when they can rightly be called snap beans.

The increase in the number of bean varieties has been largely a development of the last 100 years. Many of our well-known varieties, such as Dwarf Caseknife, Dwarf Cranberry, Red Valentine, Refugee, Dwarf Indian Chief, and York Dwarf Wax, have been known for 100 years or more, but their origin is unknown. From 1865 to 1890 many of the new varieties introduced were brought in from France, England, and Germany. Flageolet, Fullmer, Longfellow, and Matchless are representative of this group. During the next 20 years many new varieties, including practically all of the better ones grown today, were introduced by growers and breeders in this country. The new varieties have represented improvement in vigor, disease resistance, pod color, pod length, straightness of pod, and quality. Apparently most of the older varieties produced pods that were stringy and it was not until 1894 that N. B. Keeney found what he considered to be the first absolutely stringless green podded variety. This was named Burpee's Stringless Green Pod. There now are strains

of Red Valentine, Black Valentine, and Refugee with pods which are stringless. Quality has been greatly improved for the wax pods as well as the green pods. Bountiful, Full Measure, Burpee's Stringless Green Pod, Giant Stringless Green Pod, Tendergreen, Pencil Pod, Brittle Wax, Kidney Wax, and Sure Crop are varieties introduced within the last 30 years. These are truly stringless sorts and, together with the stringless strains of the varieties mentioned above, constitute a list of the most commonly grown and suitable beans for snap pods.

GREEN PODS

Abundance. Refs. 51. Syn. Dwarf Abundance. This variety was introduced to American growers by Grey in 1916; the seed came from Vilmorin who first sponsored the variety in 1908. As grown at Geneva it proved to be a mid-season variety, 55 days, seven days later than Black Valentine. It is very productive with long, slender pods stringless only in very early stages; of little value except as a forcing or early shell variety.

Plant 1 to $1\frac{1}{8}$ feet tall, erect, vigorous. Foliage dense, dark green, smooth; leaflets very large, $5\frac{3}{4}$ inches long, nearly 4 inches wide, long, broadly taper pointed. Flowers lilac. Pods 6 to $6\frac{3}{4}$ inches long, $\frac{1}{2}$ inch wide, broadly ovate in cross-section, straight, with tapering, pointed end and long, slender, straight tip; color rather distinctive, mingled dark and light green. Seeds 4 to 5, about 75 to the ounce, cylindrical to long kidney, flattened, with rounded ends, deep carmine violet in color.

Asgrow Valentine. This is a new bean of recent introduction coming from a cross between Pencil Pod (wax) and Black Valentine. The Associated Seed Growers, Inc., are the sponsors for this new variety which came from their breeding grounds at Filer, Idaho, in 1930. The improvement as here offered is due to the elimination of the stringy character from Black Valentine. The pods of Asgrow are without string and equally early in season with Black Valentine.

Plants are practically identical with those of the old type Black Valentine; pods long, 6-7 $\frac{1}{2}$ inches, quite straight thick or oval in shape, entirely stringless, with some fiber, meaty and fine texture. Seeds jet black and identical in size and shape to those of Black Valentine.

Barbes. Refs. 47, 93, 94. A French variety, originated in the Midi and introduced about 1889, which is almost identical with Hundredfold, but with rather larger, lighter-colored seeds, and with more distinct eye-ring. It was also considered more vigorous and more productive.

Barteldes Stringless Green Pod. This variety is distinctly different from all other stringless green pods. It was offered for the second time by Barteldes in 1912 and originated some time before that date with a market gardener near Ottumwa, Kansas. It is very early, 47 days, in season with Burpee's Stringless Green Pod, not especially productive, pods rather short but fleshy, brittle, stringless, fiberless and fine textured; somewhat similar in general characters to Canadian Glory.

Plant very dwarf, about 10 inches tall, erect, with comparatively few branches, runnerless. Foliage very dark green, somewhat glossy; leaflets 3 to 3 $\frac{1}{2}$ inches long, 2 $\frac{1}{8}$ to 2 $\frac{1}{4}$ inches wide, widest very near base, tapering to slightly rounding edges, rather sharp points. Flowers bluish pink. Pods 4 $\frac{1}{2}$ to 4 $\frac{3}{4}$ inches long, broad-

oval or ovate in cross-section, plump, considerably curved, with pointed ends terminating in long curved tips, medium green in color. Seeds 4 to 5, about 90 to the ounce, very short oval, or usually ovate, about $\frac{3}{8}$ inch long, three-fourths as wide, very plump, with strongly rounded ends, never truncate, pinkish fawn, distinctly marked with large areas of lemon yellow, with quite wide purplish-brown eye-ring, the purple color often extending in faint streaks over ends of bean.

Best of All. Refs. 14, 16, 26, 27, 29, 41, 47, 48, 51, 63, 80, 81, 91, 97, 98. Syns. Best Dwarf, Breck's String and Shell, Earliest Green-pod, Isbell's Earliest, McMillan's Prolific, Shipper's Favorite, Sion House, Sutton's Dwarf Sugar, Turc. Tracy says Best of All originated in Germany and came to America about 1876. We have been unable, however, to trace it definitely to that country. Except for uncertain statements of color, it seems the same as Marten's *Phaseolus oblongus turcicus*. Several names, later made synonyms with Best of All, were known quite early in France and England. It is still occasionally listed and in its better form is a very attractive and useful string bean. It was formerly a favorite in southern markets, but also considered very late in season for northern growing. Best of All differs from Giant Forcer only in color of seed; from Longfellow in seeds of different color and shape and in slightly thicker, longer, and more curved pods.

Plant about 1 foot tall, not twining. Foliage dark green, rough; leaflets large, obovate, taper pointed. Flowers bluish pink. Pods green when young, more or less blotched rose, smooth, almost straight, constricted, with blunt, curved tip, 5 to $5\frac{1}{2}$ inches long, with 3 or 4 beans (Tracy describes two types, one flat-podded, much like preceding; the other a later development, a round-podded type, 7 inches or more long, with 6 or 8 crowded seeds.) Seeds more plump in round pod type, oblong, or broad kidney-shaped, with ventral edge straight, slightly to considerably flattened, round oval to flattened oval in cross-section, ends rounded or slightly compressed, buff to light brown, mottled and streaked with dull red, with yellow ring about the eye, quite similar to Horticultural beans in color, but easily distinguishable by oblong, slightly flattened form.

Black Belgian. This bean was known and commended for earliness by Reichard, who wrote in 1821. It was at one time a very popular and widely distributed variety, especially in Europe. It was grown at Geneva in 1883 and 1884.

Plant moderately vigorous, strictly dwarf, $\frac{5}{8}$ to 1 foot tall, compact; leaflets of medium size, somewhat pointed, but slightly crumpled, dull pale green. Flowers lilac. Pods 4 to $4\frac{1}{4}$ inches long, straight, green when young, later with purplish patches, stringy, fibrous. Seeds 5, about 115 to the ounce, slightly less to rather more than $\frac{1}{2}$ inch long, broad, elliptical, sometimes slightly kidney-shaped, shining black.

Black-Eyed China. Refs. 13. A variety mentioned only by Burr, and not traceable in England, France or Germany. It was said to produce fair snap pods and dried beans but was at its best when used for shelling green; early, productive, ripening evenly.

Slightly less vigorous than China Red-eye, with 5-inch pods each containing 5 or 6 oblong seeds, one-half inch long, three-eighths inch wide, slightly flattened, with ends usually rounded but sometimes truncate, white, spotted and eye marked black.

Black Prince. Refs. 48. This name does not occur in American catalogs but Jarvis described it as very similar to Black Valentine in pod, and in plant

somewhat as Wonder of France. It originated in France, probably with Denaiffe, about 1899.

Plants more erect than those of Negro Long-pod; earlier and more productive; but pods shorter, more curved, very dark green, stringy. Seeds longer, possibly more plump, and more often runcate at ends, shining black.

Black Speckled. Refs. 47, 51, 93, 94, 97. Burr, Wing and Irish described Black Speckled and it was mentioned in the American Horticultural Annual. It was of French origin, dating back to the middle of the last century, and was best known in the gardens near Paris. It was also grown in England and Germany. This variety appears to correspond very closely to the old, or flat-podded type of Refugee, as several of Martens synonyms are given for both.

Plant dwarf, rather tall, $1\frac{1}{2}$ feet or more, erect, much branched, runnerless, very vigorous, early midseason. Foliage large, abundant, deep green. Flowers lilac. Pods long, 4 to 6 inches, with rather long tips, nearly circular in cross-section when young, later, broad, flattened light green often marked purplish or violet, becoming yellowish with age, stringy, fibrous in flattened stages, but crisp and tender when young. Seeds 6, about $\frac{5}{8}$ inch long, hardly half as wide, not plump, oblong, or slightly kidney-shaped with rounded ends, very rarely compressed, russet or fawn soon changing to dark brown or almost black, spotted and splashed with red.

Black Valentine. Refs. 30, 41, 48, 49, 77, 88, 91. Syns. Black Seeded Valentine, French String, King of the Earlies, King of the Earliest, May Queen. The name Valentine seems to have been in common usage for varieties of garden beans, yet in no case is the origin of the particular sort which was chosen to bear the name known. In 1897 Peter Henderson & Company introduced two new beans, Black Valentine, which according to Tracy may have been only a return of an old bean of that name known before 1850, and Cream Valentine. No explanation as to source or origin of either was noted. Black Valentine seems to be the only black seeded green-pod bean that has continued as a popular variety. Denaiffe lists ten green-podded varieties having black seeds, none of which are in usage in this country.

Black Valentine is widely grown, especially in the South, as a shipping bean, probably grown more than its quality merits, altho if a stringless type becomes available, this feature, together with its hardiness and rather attractive pods will again warrant its retention as a leading variety. It is not a home garden or canning variety because of the black seed which develops color quite early. It is a second early, 49 days at Geneva, coming 3 to 5 days after the very earliest sorts such as Bountiful and Stringless Greenpod.

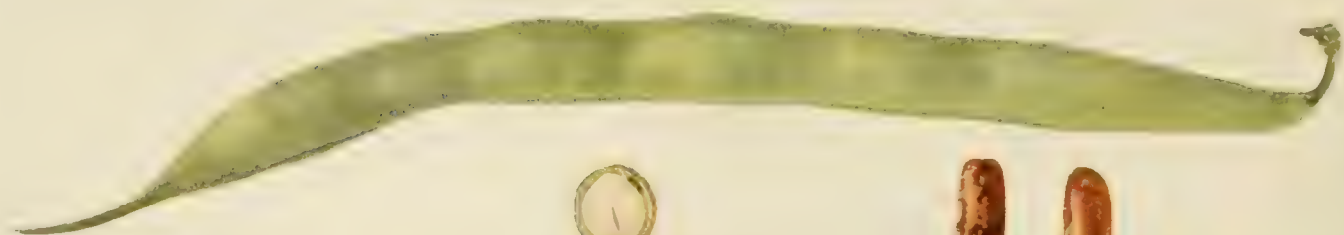
The pod characters resemble Longfellow, altho pods are longer, flatter, and more perfect in shape and with more parchment. The color of seed is different. Foliage of Black Valentine is darker than Red Valentine, and is of more open growth, the pods appearing more above the foliage, but the plants are neither more erect nor taller.

Plant medium in size, from 12 to 14 inches tall with a spread of 1 foot or slightly better; erect, rather open in habit, runnerless; vigor only fair, but very hardy, moderately productive, pods borne rather high. Stem heavy, round, smooth, short internodes; branches

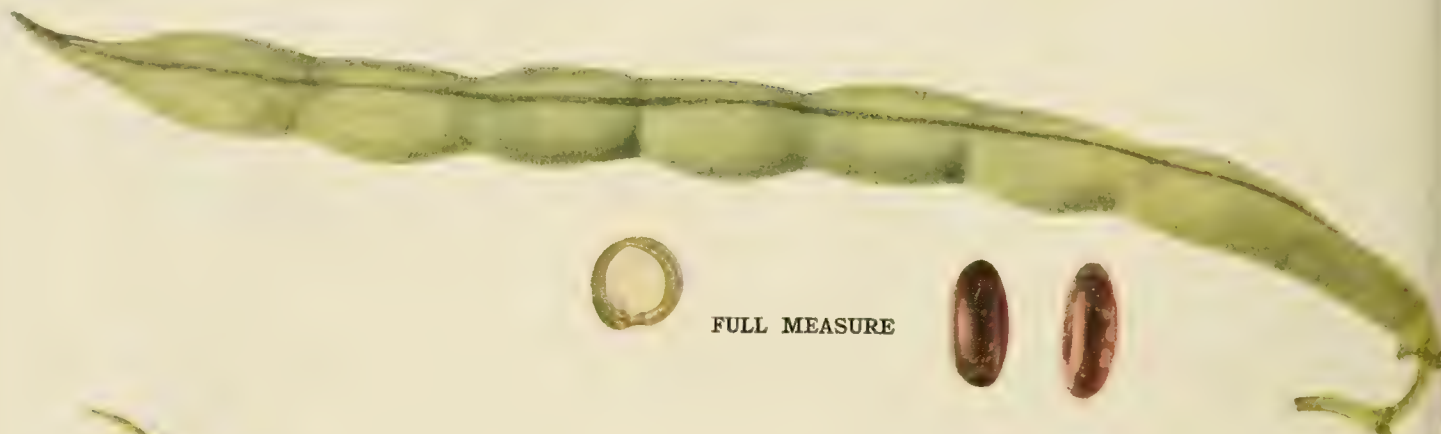


BLACK VALENTINE

Natural size



EMPEROR OF RUSSIA



FULL MEASURE



LONGFELLOW



HODSON GREEN POD



DWARF GREEN PODS

(Natural size)

few, no secondaries, mostly green but occasionally slightly purplish tinged at nodes on stem and blossom stalks. Foliage scanty accentuated because of open habit of growth, medium green; leaflets slightly rough and crumpled, thin, rather than thick, very light pubescence, rather small to above medium, $3\frac{1}{4}$ inches long by about $2\frac{1}{2}$ inches wide, widest $\frac{1}{4}$ distance from base, distinctly taper pointed, lateral leaflets quite one-sided. Flowers rose purple.

Pods borne above foliage, light green (Kildare green) in color. Quality rather poor, as pods are stringy, quite fibrous and tough. Size medium long, narrow, quite plump, ($5-6\frac{1}{2} \times \frac{3}{8} \times \frac{5}{16}-\frac{3}{8}$ inches), and containing 6-7 seeds in a pod. Shape round, nearly circular in cross-section, very slightly curved, straight backed, regular, not crowded, smooth, filled to the tip, and rounded at the end. Spur short and straight. Suture, placental is flat and carpellary, obtuse. Seeds small, $1.3 \times .7 \times .5$ cm (102 per oz.), oval to oblong, occasionally somewhat reniform; plump, truncate or abruptly rounded ends. Hilum small, flat, or slightly indented. Color shining jet black over entire surface.

Blood Speckled. Refs. 47, 93, 94. This old bean was probably little known in America but was grown and tested at Geneva and the Missouri Botanical Garden. In Paris markets it was very popular until 1906 as a dry shell bean. For snap pods it is tough, and altho excellent as green shells, it is used mostly as a dry shell bean.

Plant with many short barren runners. Pods long, straight, rather slender, constricted, short-tipped, green often striped purplish. Seeds 5 or 6, longer and much broader and more flattened than those of Valentine, but somewhat similarly marked:—according to Wing, light brown or dun color, almost entirely covered with dark red (in blotches and streaks), the two colors sharply separated with a yellowish brown eye-ring.

Boston Market. Refs. 27. Salzer is said to have introduced this variety in 1891. As described by the Michigan Station it appears to be a very early, very small-bushy, short, curved-podded, stringless Valentine, picking over a very long season, but not very productive because of small plants and small pods.

Bountiful. Refs. 41, 48, 50, 53, 73, 77, 91, 99. Syns. Breck's Boston Snap, Improved Six Weeks, Sutton's Plentiful. During the late 90's it was the practice of certain of the larger seed companies to introduce each year a few new varieties and offer prizes for appropriate names. Thru this agency Peter Henderson in 1898, offered twenty-five dollars as a cash premium for the best name sent in for New Green Bush Bean No. 1. Abel Steele of Ferguson, Ontario, won the first prize with the name Bountiful. This variety, therefore was introduced in 1898 and named Bountiful the following year. Henderson secured the seed from D. G. Burlingame of Genesee, New York. It was said to be a selection from Long Yellow Six Weeks, certainly its general resemblance to this variety would support this belief. For its type it is not approached by any other variety, in season, vigor, productiveness, appearance, and quality.

The early history of Bountiful shows it to have been recommended chiefly as a home garden variety. Its rise as a commercial sort has been rather slow, but since 1920 it has forged ahead of all other greenpod beans for market use. It is now acknowledged to be the earliest and best in quality of the strictly stringless flat podded sorts. It can be planted early or late and

because the pods remain in good condition for a long time after picking it has become very popular as a variety to grow for shipment.

At Geneva 47 to 50 days to the first picking; as early as Tennessee Green Pod or Black Valentine and about 3 days earlier than Full Measure, Stringless Greenpod or Long Yellow Six Weeks, 10 days earlier than Refugee. While Bountiful was selected from Long Yellow Six Weeks, it differs from that variety in lighter color of foliage, earlier, larger, straighter pods, and superior quality. Grenell Stringless is later in season and has darker foliage.

Plant strictly dwarf, medium to large, 15 to 18 inches high with spread of from 12 to 18 inches, quite bushy, medium erect when young, rather straggly when fully grown. Plant appears to be top heavy, after heavy rains or winds it is liable to appear prostrate and cover quite a spread in row; very vigorous, hardy, heavily productive over a long season. Stem stout, round, ridged above, internodes long; branches few, slender, green thruout. Foliage abundant, leaves large in size, very light green in color, in field appeared as having the lightest green foliage of all bush sorts; leaflets smooth to very slightly rough, medium thick, sometimes slightly wrinkled, older leaves crumpled, $4\frac{1}{4}$ to $4\frac{3}{4}$ inches long, $2\frac{7}{8}$ to $3\frac{1}{2}$ inches wide, at one-fourth or less distance from base to tip, sides tapering regularly or with slight out curve to rather sharp tip three-fourths inch long. Flowers bluish pink.

Pods borne both above and below foliage, light yellowish green (light dull green yellow) in color. Quality excellent; brittle, stringless, with small amount of fiber and fine texture. Size medium to long, quite broad and medium slender to plump, ($6-7 \times \frac{1}{2} \times \frac{3}{8}$ inches), containing 6-7 seeds per pod. Shape medium flat to round, long to broad oval in cross-section, straight to slightly curved, straight backed, regular, not crowded, smooth, filled to the tip and edge, and pointed or tapering at the end. Spur long, slender and curved. Suture, placental is flat to slightly indented, and carpellary, broadly acute.

Seeds medium, $1.4 \times .8 \times .6$ cm (65 per oz.) oblong, somewhat reniform, plump, with abruptly rounded ends. Hilum small, flat. Color fawn when first harvested changing to dark dull straw yellow (cinnamon) as it ages. A distinct darker brown, narrow eye-ring is always present.

Brown Holland. Refs. 47. Ascribed by name to Holland in the first reference we find this is apparently of European origin. It approaches very closely the earlier Stringless Green Pod types (see Irish). Early and very productive.

Plant $\frac{5}{6}$ to 1 foot tall, with many branches. Foliage light green, rough but not wrinkled, with very large leaflets. Flowers white, often blushed. Pods 4 to $4\frac{1}{2}$ inches long, occasionally 5 inches, half-inch broad or less, smooth, slender, approaching cylindrical, slightly curved, fleshy, swollen over beans, stringy, tough soon, light green becoming pale yellow. Seeds 4-5, $\frac{1}{2}$ to $\frac{5}{8}$ inch long, more than half as wide, ovate oblong, often almost kidney-shaped, with rounder, or occasionally truncate ends; very dark dirt brown, with darker eye-ring.

Burpee's Stringless Green Pod. Refs. 11, 30, 35, 36, 41, 47, 48, 49, 50, 53, 59, 62, 69, 77, 87, 91, 99. Syns. Bell's Prolific Green Pod, McKenzie's Matchless Stringless Green Pod, Prolific Green Pod, Schultz's Stringless Greenpod, Stringless Forcer, Stringless Green Round Pod, Stringless Wonder. This bean was introduced in 1894 by W. Atlee Burpee and originated with N. B. Keeney who claimed it to be the only absolutely stringless green podded bean on the market. Since its introduction it has retained its name as originally offered

until recently when many seedsmen have the variety listed as Stringless Green Pod. Burpee's Stringless Greenpod gradually became one of the leading sorts. It was followed by Bountiful in 1899, Giant Stringless Green Pod in 1898, and Stringless Refugee in 1904. These four are today the leading stringless green podded varieties. Stringless Green Pod, offered by Thorburn, 1898, was undoubtedly the same stock as Burpee's Stringless Green Pod.

What is the parentage of this the first stringless green podded variety? A letter from the originator, N. B. Keeney, published in Burpee's catalog of 1894 is our only source of information. We quote therefrom: "It (Burpee's Stringless Greenpod) is the result of five years of careful work combining the desirable qualities of the Yosemite Mammoth Wax, Burpee's Saddleback Wax, and Ne Plus Ultra, and it is our best selection out of over two hundred varieties. It gets its round pod and stringlessness from Yosemite and Saddleback, and its long, straight, handsome green pod from the Ne Plus Ultra." No other details are available. Only by comparing characters as now found in Stringless Greenpod with those of Yosemite, Saddleback Wax and Ne Plus Ultra can one surmise as to the possible direction of the crossing if any.

Irish makes Stringless Green Pod (from Thorburn) a sub-variety of Brown Holland which he describes in some detail, and Denaiffe notes its similarity to that variety. Certainly Stringless Greenpod is an improvement over Brown Holland in its pod characters. More than a dozen strains of Stringless Greenpod have been grown in recent tests, under the original name, known and unknown synonyms. Considerable difference was noted, and comparison with the same or other strains grown elsewhere showed even wider ranges in size and shape of pods and seeds as well as height of plant; yet it is believed that all names given in our synonyms apply to varieties so similar in useful qualities that they may be considered identical. Stringless Green-pod is an early, hardy, productive variety profitable for both home and market. It is used to some extent by the canner but in general the pods are too thick and large; the variety passes thru the canning stage rather rapidly, develops a large prominent seed rather quickly and therefore is not suitable to the majority of canners.

This is an early bean 46 days to edible pod at Geneva, 3 days earlier than Full Measure, about the same in season as Bountiful and Tennessee Green Pod, and 10 to 12 days earlier than Stringless Refugee. It is, earlier than Giant Stringless Green Pod but has shorter, thicker and more curved pods, which are more constricted between seeds. The seeds are much darker in color and the pods are not as attractive but are as good in quality. Byers has pods which are longer and straighter and plants which are larger and more vigorous. Plants of Stringless Green Pod are more open in growth habit than those of Full Measure or Byers.

These varieties differ from Burpee's Stringless Greenpod; Adams Stringless, Giant Stringless, Grenell Stringless Green Pod, Hodson Stringless Green Pod, Jones

Stringless, Prolific Stringless Green Pod, Stringless Refugee, Barteldes Stringless Green Pod.

Plants strictly dwarf, 12 to 15 inches tall, 12 to 15-inch spread in row; stocky, erect when young, somewhat more spreading with weight of pods; somewhat open with few blossom stalks appearing above plant; hardy, vigorous, productive over moderate bearing period. Stem thick, ridged above; branches few, green thruout. Foliage scanty to medium, medium green; slightly rough, not glossy, with slight fine pubescence; leaflets broad, about 4 inches long and 3 inches wide near base, extending almost straight to short taper-pointed tips. Flowers lilac.

Pods borne very largely high among the foliage, medium dark waxy green in color. Quality excellent; fleshy, extremely brittle, without fiber and entirely stringless. Size medium to short, fairly broad and thick, ($3\frac{1}{2}$ -5 x $\frac{1}{16}$ x $\frac{3}{8}$ inches) and containing 4-6 seeds in a pod. Shape very broad oval to nearly circular in cross-section, slightly curved, straight-backed, somewhat constricted, not crowded, smooth, filled to the tip and edge, and somewhat tapering at the end. Spur medium long, fairly stout and somewhat curved. Suture, placental is slightly indented and carpellary, rounded to obtuse.

Seeds medium 1.4 x .8 x .7 cm (75 per oz.) broad oval to cylindrical, very plump but not quite circular in cross-section, rounded and occasionally truncate ends. Hilum small, flattened. Color fawn or buff to dark brown (argus brown) over entire surface with a narrow dark brown to black eye-ring.

Byers. Refs. 41, 48, 88, 91. Byer Bros. of Tennessee in 1897 sent out test samples of a new bean found in their fields. Two years later it was introduced by Childs as a very promising new stringless greenpod. It is still offered by this firm and by no other as far as we have been able to ascertain. It is considered a good home garden bean because of high quality and long season. It also has possibilities as a market bean. Midseason, 50 days at Geneva, 4 to 5 days later than Bountiful, 3 to 4 days later than Stringless Greenpod, 2 days later than Full Measure.

The seed resembles seed of Full Measure and Pride of Iowa in color and markings. The seed markings also resemble those of Refugee but with more brown color. The pods are longer and more irregular in size than pods of Stringless Greenpod and Full Measure; are straighter but with the same characteristic inch markings and are more of a glossy green than the pods of Giant Stringless Greenpod. The plants are more branching with foliage more dense and leaflets narrower and smaller than both those of Stringless Greenpod and Full Measure.

Plant large, 15 to 18 inches tall, with spread of 16 inches; erect when young, but later when plants are older and loaded with pods often somewhat drooping, runnerless; vigorous growth, very productive over long bearing period. Stem stout, round, ridged above; branches many with secondaries, green thruout. Foliage abundant, dense, medium green, slightly crumpled, smooth, glossy, medium thick; leaflets rather long, $4\frac{3}{4}$ by $3\frac{1}{4}$ inches wide. Flowers bluish pink.

Pods borne intermediate among the foliage; medium light green in color. Quality good to excellent; fleshy, brittle, tender, but rather coarse in texture, stringless, without parchment. Size medium long, fairly broad and very plump, (5-6 x $\frac{3}{8}$ - $\frac{1}{16}$ x $\frac{3}{8}$ - $\frac{1}{16}$ inches), containing 5-6 seeds per pod. Shape round, nearly circular to very broad cordate in cross-section, straight, often creasebacked, regular, quite crowded, smooth, filled to the tip and edge, and gently rounded at the end. Spur long, slender and slightly recurved. Suture, placental is indented and carpellary, decidedly rounded.

Seeds medium large, 1.4 x .6 x .55 cm, (68-70 per oz.). Shape medium long, cylindrical, very plump, very broad oval to nearly

circular in cross-section; ends very abruptly rounded to truncate. Hilum small and flattened. Color deep buff (pinkish cinnamon) to (orange cinnamon) under color, mottled and splashed over the greater portion of the surface with varying shades of deep reddish brown (bay) and (auburn).

Canadian Express. Refs. 53. This variety was introduced by Carter sometime before 1925, as coming from a Sunrise x Canadian Wonder cross. It is both earlier and more productive than Canadian Wonder.

Pods very long, $6\frac{1}{2}$ to $7\frac{1}{2}$ inches, almost straight, slender, rather flat, very long-tipped, green, crisp and tender when young, slightly stringy later; seeds one-fourth smaller than those of Canadian Wonder, slender but fairly plump, very long oval with eye-side straight, very rarely kidney-shaped, rich crimson purple or purplish maroon, darker than Canadian Wonder, darker eye-ring hardly noticeable.

Chalandray. This is an old French variety, grown for half a century as a forcing bean; it is also, as Superb Early Forcing, grown in England for the same purpose. Chalandray was tested and described at Geneva and at the Missouri Botanical Garden; listed by Thorburn and described by Tracy and Jarvis as Veitch's Forcing.

Plant very dwarf and compact with small, long bright green leaflets, somewhat blistered and curled. Pods medium in length but variable, slightly curved, almost round in cross-section, long-tipped, fleshy, green, much like those of Wonder of France, but considerably swollen over the beans. Seeds medium-sized, about 130 to the ounce, short broad oval or slightly ovate, usually somewhat flattened but occasionally nearly round in cross-section, with short-rounded ends, not truncate, yellowish brown, sometimes lighter at one end and often with greenish lines along the sutures.

Chevrier. Refs. 53. Syn. Chevrier Vert. This selection from Green Flageolet originated about 1878 at Bretigny, just south of Paris, with the market gardener whose name it bears. It was commercially distributed in 1880 and soon became very popular around Paris. It was grown at this Station in 1883, but seems not to have been regularly listed until 1894. Chevrier is not quite as hardy or disease-resistant as Wonder of France, which followed it. The pods, except when very small, are of poor quality, tough and stringy.

It differs from White Flageolet, and its earlier green-seeded strain, Green Flageolet, mainly in a marked intensification of the green pigmentation, extending to all parts of the plant but horticulturally important in pods and seeds. It appears to be most reliable of all the green-seeded beans in this respect; altho in the early tests at this Station the green of the seeds showed faintly or not at all, probably because of delayed harvesting. Usually the green extends through the cotyledons and imparts a fine color to the cooked beans.

Cholet. Refs. 51. Vilmorin introduced Cholet shortly before it was brought to America by Henderson in 1907. The Royal Horticultural Society gave it the "highest award" in 1910. It is similar to Early Refugee in foliage color, leaf characters and roundness of pod.

Plant dwarf, compact, vigorous; foliage dark green; leaflets small, pointed; flowers pale blush. Pods 4 to 6 inches long, slender, light green, soon stringy. Seeds long, very pale dun or chamois color.

Cream Valentine. Refs. 48, 49, 88, 91. This was a selection from Red Valentine, originated in Genesee County, N. Y., and introduced in 1897 by Henderson.

Pods of medium size ($4\frac{3}{4}$ inches long) curved, round in cross-section or broader than thick, strongly crease-backed, medium green, very brittle, stringy but almost fiberless and of good quality. Seeds 5 or 6 crowded in pod, pinkish cream with faintly darker eye-ring. Apparently more like Long Yellow Six Weeks than like Valentine in size and shape, but lighter in color and decidedly truncate at ends.

Dun-colored. Refs. 13, 16, 41, 47, 61, 63, 97, 98. The varieties, Dark and Light Dun-Colored, trace back about as far as any of which we have record, one of the varieties listed by Mawe-Abercrombie in 1778 undoubtedly being the ancestor of Dark Dun, from which the form with lighter-colored seeds was later derived. They were grown in America from 1828 at least, but are now of historical interest only.

Plants rather tall dwarfs, bushy and vigorous, with large, light green wrinkled foliage, purplish blossoms. Pods short, almost straight, slender but nearly round, light green but with a peculiar striated appearance. Seeds 4-5, large, $\frac{9}{16}$ inch long, broadly oblong, with truncated ends or slightly kidney shaped, slate drab or dun color, changing to dark brown, with almost black eye-ring.

Dwarf Caseknife. Refs. 13, 29, 47, 49, 51, 53, 93, 94. Syn. Dwarf Cimeter, Dwarf Early White Scimitar, Dwarf Sabre, Emperor William, First in Market, Rhode Island Caseknife. The name Dwarf Caseknife is here used to cover a large group of names applying to a rather distinct type of bean, the so-called varieties being either identical, making the names strictly synonyms, or so similar as to be inseparable. The name was first applied about 1865 to Dwarf Sabre or Dwarf Cimeter as mentioned by Burr. Henderson in 1892 offered Rhode Island Dwarf Caseknife and in 1904 Kendal gave the name to Emperor William, a variety coming from Germany and known since 1880. The type originally came from France and because of its large white seeds was early used as a shell bean or as a dry one for winter use. The pods are unattractive and not suited for use as snaps; plants rather scraggly in growth. White Kidney has replaced Dwarf Caseknife for the production of the larger sized white dry shell beans.

Plant about 10 inches tall, spreading, not twining; leaflets of medium size, broadly wedge-shaped, occasionally heart-shaped, rather dark green, not inclined to wrinkle. Flowers white. Pods light greenish yellow, straight or nearly so, swollen by the beans, with slender, moderately long curved tips, about $5\frac{1}{2}$ inches long, $\frac{1}{2}$ to $\frac{3}{4}$ inch wide, broadly ovate, becoming more flattened at maturity. Seeds 3 or 4, polished white when ripe, slightly more than one-half inch long, about two thirds as wide, and less than one-half as thick, decidedly flattened, broad, oblong.

Dwarf Early Fleuriel. When grown at Geneva in 1888, this variety proved to be late, subject to mildew, short-podded, and unproductive. Vilmorin says it is early and more productive than Canada Yellow.

Plant very dwarf, very compact, much branched, with finely blistered foliage and white flowers. Pods about 4 inches long, much curved, about $\frac{1}{2}$ inch wide, (entirely fiberless, Vilm.). Seeds of medium size, very short oval, very pale yellowish brown with white or brown eye-ring.

Dwarf Russian. Refs. 47, 93, 94, 97, 98. Vilmorin introduced Dwarf Russian before 1882, but the name indicates a foreign origin. It was quite popular in

France, having been listed in that country for thirty years.

Plant rather tall, vigorous, not early, but productive, with long, nearly straight, broad pods, approaching cylindrical, rather short-tipped, fleshy, not much swollen by beans, soon stringy and parchmented, light green to pale yellow; usually more or less splashed with purple. Seeds very large, broad-oblong or very long ovate, tobacco brown with darker eye-ring, without gloss and seed coat very dull, almost rough, distinct from all others of the type.

Dwarf Soissons. Refs. 13, 28, 47, 51, 56, 93, 94. A variety that is very similar to the Dwarf Caseknife group. Wing and others use the name as a synonym for names in that group, but Vilmorin, Martens and Denaiffe make it distinct, the separatory characters being taller plants, more productive, of shorter pods, one less seed to the pod, smaller, plumper seeds and later in season.

Early Refugee. Refs. 5, 9, 16, 26, 29, 30, 48, 49, 59, 61, 77, 80, 81, 91. Syns. Early one-Thousand-to-one, Excelsior, Extra Early Refugee, Excelsior Refugee, Pages Extra Early. In *Annals or Horticulture* 1891 (Bailey) Early Refugee is said to have been introduced by Henderson. Both Tracy and Jarvis credit Thorburn with its introduction in 1888 with the added information that it was developed by a market gardener in the vicinity of New York after continuous selection from Refugee. It is similar to Red Valentine; a good shipper and is used somewhat for canning altho for that purpose Stringless Refugee is the better suited. At Geneva 50 days to first pods, 4 to 5 days later than earliest varieties but about ten days earlier than Stringless Refugee.

Early Refugee differs from Refugee in several important respects: the plants are more dwarf, usually 1 foot or less tall, heavier, more erect, stems much branched but runnerless, making a very compact bushy growth with the foliage slightly darker; pods shorter, more crease-backed, slightly more curved with longer tips; seeds are perhaps a shade darker. The pods are also similar to those of Red Valentine but longer, more slender, with a slight amount of purple splashing at shell stage, and the point is more curved.

Plant similar to plants of Refugee but smaller, not as productive nor as long in season. Pods borne below foliage; light moderately waxy green in color. Quality good; very brittle, some string, quite fiberless and fine in texture. Size medium long, quite narrow and plump ($3\frac{1}{2}$ - $4\frac{1}{2}$ x $\frac{3}{8}$ - $\frac{1}{2}$ x $\frac{3}{8}$ - $\frac{1}{2}$ inches) containing 5-6 seeds per pod. Shape round, nearly circular in cross-section, slightly curved, straight backed or slightly crease-backed, regular, not crowded, smooth, filled to the tip and edge and rounded on the end. Spur long, slender and recurved. Suture, placental is slightly indented and carpellary, obtuse to rounded.

Seeds medium, 1.4 x .6 x .55 cm (90-95 per oz.), oblong, nearly cylindrical, very plump; ends abruptly rounded to truncate. Hilum small, flat. Color very dark bluish-black or purple (dusky violet blue) instead of the lighter shade of purple as in Refugee, splashed and mottled over the entire surface with pale buff (pale pinkish cinnamon.)

Eclair. A foreign variety which was brought to this country by Thorburn in 1904 and which was distinct from the variety known as Lightning, which is the English equivalent of the French name. According to Thorburn the originator, who is unknown, said it was the earliest of all dwarf snap beans, or more than two

weeks ahead of White Lyonnaise, which it resembles in its very long, slender, round, fleshy, stringless green pods.

Emile. Refs. 97, 98. Perrier originated this old French variety shortly before 1880; its short pods prevented it from becoming one of the leading green-pod snap and green-shell beans. It was grown at this Station and at the Missouri Botanical Garden, where Irish considered it the same as Osborn, a very similar English variety. It was also listed commercially in America but apparently never grown as much as its merits would seem to warrant. It was very early, very productive, and its pods held their attractive green color over a long period.

Plant very dwarf, without runners or twining habit. Foliage abundant, dark green; leaflets of medium size, broadly obovate, taper pointed, somewhat curled. Flowers bluish pink. Pods green, not marked purplish, rarely over 4 inches long, stocky, round in cross-section, somewhat swollen by seeds, thick-fleshed, stringless and fiberless, of fine quality. Seeds 5 or 6, rather more than half-an-inch long, half as wide, oblong, only slightly tapering toward one end, ends well rounded, mottled, dark chocolate purple over light brown, like Mohawks in color, but much broader in proportion to length.

Everbearing. Refs. 48, 50, 51, 91. This is a French bean of the Flageolet type introduced there in 1897 by Vilmorin and into America in 1899 by Burpee. In France, where snap pods are used very early, this bean soon became popular; but in America the variety cannot be used for string beans since the pods are tough and stringy at the size we harvest them. It was considered a fair quality green-shell bean, but quite inferior to many other varieties of this type. It soon disappeared from cultivation in this country.

Plant very much like that of Dwarf Caseknife but characterized by production of late flowers in clusters high above the foliage. Leaflets rather longer and narrower. Pods shorter, more slender and thinner. Seeds smaller and not as broad, somewhat kidney-shaped.

Feltham Prolific. Refs. 53. This is a variety that was introduced by Watkins & Simpson, London, England (trial grounds at Feltham), in 1919, and reached America in 1921.

It is almost identical with Magpie, but an improvement on that variety in having pods more slender, less stringy and fibrous and not showing seeds until long past string bean stage. Smaller in every way than Magpie. Plant shorter; leaflets a little finer. Pods shorter and more slender; almost straight. Seeds smaller, usually square at ends thru crowding in pods, marked white and brown (sudan) instead of white and black, the color being distributed as in Magpie.

Flageolet Victoria. Refs. 49, 50. Tho bearing the name Flageolet, that of a French group of beans, this variety apparently did not originate in France, since Denaiffe said that it had not been adopted in his country. It was introduced into America in 1894, by Henderson, who listed it only three years. Afterwards Thorburn carried it for three or four years, but it never became very popular.

Plants about $1\frac{1}{4}$ feet tall, very vigorous, with "enormous" leaves. Flowers white. Pods very long, $5\frac{1}{2}$ to 6 inches, occasionally 8 to 10 inches, flat, nearly straight, with long, slender tips, green, quite fleshy, swollen by beans, but soon stringy and fibrous.

suitable for market but not home use; good shippers. Seeds usually 5, very large, $\frac{3}{4}$ inch long, $\frac{1}{2}$ inch wide, more than $\frac{1}{4}$ inch thick, decidedly broad kidney-shaped with indented hilum; white, strikingly marked about eye with purplish "butterfly" markings, soon becoming almost black.

Fordhook Favorite. Refs. 53. Syn. White Seeded Stringless Greenpod. John W. Daily of Falling Waters, West Virginia, found a plant bearing pods with white seeds in a bed of brown seeded Burpee's Stringless Greenpod in 1903. Starting with ten beans, he increased the stock and in March of 1906 sent a sample to Burpee's. In 1910 it was offered as a novelty as "White-seeded Stringless Greenpod" and sold in sealed packets, 30 seeds for fifteen cents. Prizes were offered for the best Postal Card Reports, and in 1911 the name was changed to Burpee's Fordhook Favorite.

In general usage this variety is quite similar to Stringless Greenpod altho the white seed bestows an advantage in that it may be used as a dry shell bean. A good all round variety with large, round, plump pods, ready in 48 to 50 days, closely following the very earliest; 3 to 4 days later than Stringless Greenpod or about the same in season as Full Measure, Black and Red Valentine. Fordhook Favorite closely resembles Stringless Greenpod in plant characters, but the pods are shorter and more fleshy.

Plant medium to large, 14 to 18 inches tall, with a spread of about 15 inches in the row; erect but somewhat scraggly and open, without runners; vigor fair, moderate in yield, over fairly long season. Stem stout, round, smooth with short internodes; branches few, with some secondary branches, green thruout. Foliage scanty to medium, medium green, not glossy, rough, crumpled, slightly wrinkled, moderately thick, with rather heavy veining; leaflets large, $4\frac{1}{2}$ inches long by $3\frac{1}{2}$ inches wide, widest one-quarter distance from base, sides sloping gradually to broad short point. Flowers white.

Pods borne intermediate among the foliage; light silvery green in color. Quality good; practically stringless, brittle, small amount of fiber, and of fine texture. Size medium long, quite broad and plump ($4\frac{1}{2}$ -6 x $\frac{1}{2}$ x $\frac{1}{16}$ inches), containing 4-6 seeds per pod. Shape round, broad oval in cross-section, curved, straight-backed to slightly crease-backed, somewhat constricted, not crowded, quite smooth, filled to the tip but not to the edge, and pointed at the end. Spur short, stout and straight. Suture, placental is slightly indented and carpellary, obtuse.

Seeds medium to large, quite variable, 1.4 x .8 x .7 cm, (55-90 per oz.), oval, sub-reniform, plump; well rounded ends. Hilum small, protuberant. Color ivory white, indistinctly marked, with a grayish vein-like system that shows thru the seed coat.

French Mohawk. Refs. 48, 91. This probably was of English origin, sometime before 1883. It was twice introduced into the United States, and was noteworthy for its long, straight pods. It is much like Mohawk, but makes a larger, coarser growth, and produces pods which are much longer, and more slender. It is hardy and productive, but quite late.

Plant $1\frac{1}{3}$ to $1\frac{2}{3}$ feet tall, very erect, and vigorous, with large, rough, green foliage. Flowers pink. Pods almost 8 inches long under good conditions, slender, almost straight, round-oval in cross-section, green splashed with purple, very tough, stringy and fibrous, poor in quality. Seeds $\frac{3}{8}$ to $\frac{1}{4}$ inch long, slender, oval in cross-section, truncate or rounded at ends, deep bluish black, sparingly splashed pale buff.

Full Measure. Refs. 11, 48, 69, 99. Syns. Perfection Stringless, Pride of Iowa, Prolific Stringless.

Peter Henderson & Company first listed Full Measure in their catalog of 1906. It was said by them (cat. 1907) to have been developed from a cross between Yosemite Mammoth Wax and Refugee or 1000 to 1. This is a variety well suited for the home garden or for market use; classed as a second early, coming just after the Stringless Greenpods, 49-53 days at Geneva, about three days later than Bountiful. Full Measure most resembles Byers and Giant Stringless, the pods are more scimitar curved, shorter, with the characteristic inch marks found on pods of these varieties. The seeds are very similar to the seed of Byers.

Plant 14-15 inches high, rigid with spread of 9-10 inches in row; stocky, erect when young, compact; often quite spreading when loaded with pods; vigorous, hardy, and moderately productive. Stem very stout, round, ridged; branches few, green. Foliage medium abundant, dull medium green, slightly pubescent, thick, rough, crumpled, medium to heavy veining; leaflets above medium size, 5 inches long, $4\frac{1}{2}$ inches wide, broadest very near base, tapering uniformly to rather obscure point. Flowers blush pink.

Pods borne intermediate among the foliage; light green (glass green) in color. Quality excellent, fleshy, brittle, stringless, quite fiberless and of fine texture. Size medium to long, moderately broad and quite plump, ($5\frac{1}{2}$ x $\frac{3}{8}$ x $\frac{5}{16}$ - $\frac{3}{8}$ inches), and containing 5-6 seeds per pod. Shape round, nearly circular in cross-section, curved, occasionally scimitar shaped, slightly crease-backed, regular to somewhat constricted, smooth, not crowded, filled to the tip and edge, and pointed at the end. Spur long, medium slender and slightly curved. Suture, placental is indented and carpellary, rounded.

Seeds medium to large, 1.7 x .7 x .65 cm, (65-70 per oz.) long oval to almost cylindrical occasionally sub-reniform, very plump; ends very abruptly rounded to truncate, Hilum small, flat. Color light buffy-brown (warm buff) mottled with darker brown (antique brown) of varying intensity with a pattern resembling Refugee; marked with a narrow tawny-yellow eye-ring.

Fullmer. Refs. 63, 98. This was a very old English bean, possibly identical with Red Swiss or derived from it. It was grown at this Station the first year beans were tested, 1882; listed by Thorburn and in 1888 was tested at the Kansas Station. Tho early and productive it never gained a place in popular favor, as the pods were too short for market.

Plant $1\frac{1}{4}$ to $1\frac{1}{2}$ feet tall, stout, erect, with short runners; leaflets large, almost round, coarsely wrinkled, dark green. Flowers pale violet. Pods 3 to $4\frac{1}{2}$ inches long, very fleshy, straight, dark green, stringy and fibrous. Seeds generally 4-5, slightly more than $\frac{1}{2}$ inch long, very broad oval or distinctly ovate, very plump, colored about like Red Valentine.

Feejee. Refs. 10, 15, 47, 48, 91, 97, 98. Syns. Early Feejee, Lightning, White's Early. This bean, now known as Lightning, was cultivated in the middle of the past century as White's Early, the name Feejee being current for about thirty years from 1870 to 1900. It is now seldom grown in the United States, tho it was for a long time quite widely distributed. Feejee was considered a very early variety in America, where it was used for snaps and picked continuously in early stages over a long season; but held to be quite late in France where it was used for green shells. Wing's figures support both views, pods are ready among first but the beans mature with the late varieties.

Plants very similar to those of Dwarf Caseknife, but with purplish pigment, giving color in stripes and patches to stems,

branches, leaves, flowers and pods. Pods rather short in snap stage, $4\frac{1}{2}$ to 5 inches long later, rather rarely exceeding $\frac{1}{2}$ inch in width, flat, usually slightly curved, somewhat constricted, with short, stout, curved tips. Seeds oblong, quite strongly kidney-shaped, flattened sidewise, about $\frac{1}{2}$ inch long, nearly as broad, half as thick, varying in color,—from grayish white to mixed drab, slate and brown (Irish), from almost pure white to white mottled and streaked with various shades of dull blue and drab (Wing). Sometimes distinctly patterned by curved bands.

Galega. Refs. 15, 16, 27, 48, 49, 81, 91, 97, 98. This variety was first known about 1880 and was quite popular for a time. It is a selection from Refugee and distinguishable from that variety only by being slightly larger in plant, foliage, pods and seeds. The pods were slightly curved backwards at the neck and decidedly more reddish and the seeds were of a darker shading making them apparently like Extra Early Refugee. The general plant characters and season were the same as for Refugee altho possibly it was a few days earlier, and somewhat more productive.

Garden Pride. Refs. 48, 91. This variety was introduced in 1903 by A. N. Jones, LeRoy, N. Y., and was similar in habit and uses to the better known Fordhook Favorite of nearly a decade later. While it was rather productive of pods that were very excellent for use as snaps, they had the disadvantage of being rather poorly shaped. The seeds were considered rather small for green-shell beans.

Plants and foliage about the same as those of Fordhook Favorite. Pods distinctly curved, sometimes almost S-shaped, narrower, more oval in cross-section, with long, curved tip. Seeds decidedly smaller than those of Favorite (short-oblong) but otherwise like them.

Garland. Kendall and Whitney in introducing this as new in 1914 described it as a superior early shell bean, very productive and with seeds like those of Low's Champion but larger and longer. It was omitted from the introducer's catalog of 1918, and has not been listed by others.

Giant Forcer. Refs. 91. Henry A. Dreer introduced Giant Forcer in 1906 and listed it for about nine years. It was very similar in appearance and usefulness to round-podded Best of All, altho smaller in plant and with seed of different color.

Plant very large and spreading, but runnerless; leaflets very large, dark green, with very rough surface. Flowers light pink. Pods variable, but properly very long, over seven inches, straight, round-oval in cross-section, stringy but brittle and with little fiber, medium green in color, sparingly splashed with faint red in green-shell stage. Seeds 6-8 crowded in pod, small to medium, roundish oval in cross-section, well rounded at ends, straight or slightly rounded at eye, pale buff, sparingly splashed with fawn.

Giant Stringless Green Pod. Refs. 11, 41, 48, 50, 69, 77, 91, 99. Syns. Bell's Giant Stringless Green Pod, Colossal Stringless Greenpod, English Stringless, Giant Podded, Giant Stringless Green Pod Valentine, Improved Stringless Green Pod, Mammoth Stringless Green Pod, Newington Wonder, Norwood Stringless.

This popular bean was originated by N. B. Keeney & Son, LeRoy, N. Y. and introduced in 1898 by Johnson and Stokes as Giant Stringless Greenpod Valentine. It was said to have been a selection from Red Valentine, but if so, it would seem as tho the plants came in the

field through mechanical mixture. Just what the parentage was must remain unknown. It could well have had hybrid origin from any one of the many varieties grown at that time.

Giant Stringless Greenpod is about the same in usefulness as Stringless Greenpod, it is valuable either for a home or market garden variety where a good quality round green pod is desired. It has the good qualities necessary for packing high quality cut beans. The color in the seed coat develops fairly early and there is considerable constriction between seeds as the pods get older. At Geneva this was an early variety 47 to 48 days to the first picking, not more than 2 or 3 days later than Stringless Greenpod and from 1 to 2 days earlier than Full Measure. The pods are larger, longer, straighter, with the characteristic inch marks more prominent than with Burpee's Stringless Greenpod. It is quite similar in general characteristics to Full Measure and Byers.

Plant resembles those of Burpee's Stringless Green Pod except as noted; slightly larger, with fewer, longer and more straggling branches, foliage rather coarser and lighter in color. Flowers lilac. Pods borne intermediate among the foliage; medium dull green in color. Quality excellent, very brittle, entirely stringless, without fiber or parchment and medium fine in texture. Size long, rather narrow, and fairly plump ($6-7 \times \frac{1}{2} \times \frac{5}{8}$ inches), containing 6-7 seeds per pod. Shape round, nearly circular in cross-section, slightly curved, straight backed, somewhat constricted, not crowded, smooth, filled to the tip and edge, and pointed or tapering on the end. Spur medium long, stout, and slightly curved. Suture, placental is flat to rounded and carpellary, obtuse.

Seeds medium, $1.4 \times .7 \times .55$ cm, (70-75 per oz.) oval to cylindrical, occasionally sub-reniform, rounded to somewhat truncate ends. Hilum small, flat. Color light brown tinted ochre yellow (ochraceous-orange) distinctly a lighter shade than Burpee's Stringless; inconspicuous, darker brown-olivaceous narrow eye-ring present.

Golden Refugee. Refs. 16, 48, 61, 80, 84, 91. This was a selection from Refugee and was introduced in 1884, apparently by both Henderson and Thorburn. It was carried for a few years, with only a limited distribution by others and then dropped. In most trials it was a few days earlier than Refugee, rather less viny and stouter-stemmed, with lighter-colored foliage and decidedly light green, almost white pods, similar to those of Crystal Wax, which led canners to call it Silver Refugee. The maize yellow and metallic brown of its smaller seeds gave it the more common name, Golden Refugee. As it was less productive and considered less hardy, it did not displace the parent variety.

Gray-seeded. Refs. 47, 98. This sort was one of the earliest snap beans grown at the Station in 1883 and was included in the Missouri Botanical Garden tests in 1901. No other American references to it have been found, altho Denaiffe says it was of American origin. Altho early it was neither productive nor good in quality.

Plant strictly dwarf, under a foot, small to medium, leaflets very broad, smooth, deep green. Flowers white. Pods grayish white (pearly white-Wing) with green sutures often with purplish markings, 3 to $4\frac{1}{2}$ inches long, $\frac{1}{2}$ inch wide or less, curved, slightly flattened. Seeds like those of Taylor Green Pod in shape, not quite as large, yellowish or reddish brown, or brownish drab with veiny markings, with darker red ring around eye.



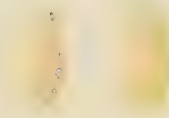
GIANT STRINGLESS GREEN POD



ROGERS STRINGLESS REFUGEE



BURPEE'S STRINGLESS GREEN POD



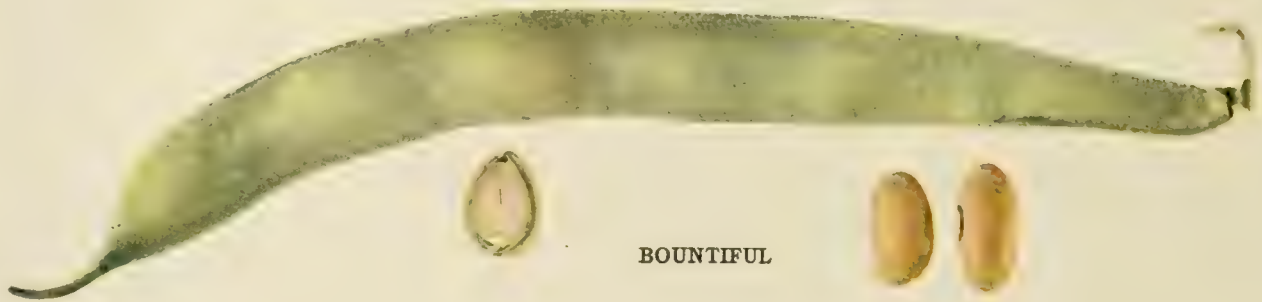
FORDHOOK FAVORITE

DWARF GREEN PODS

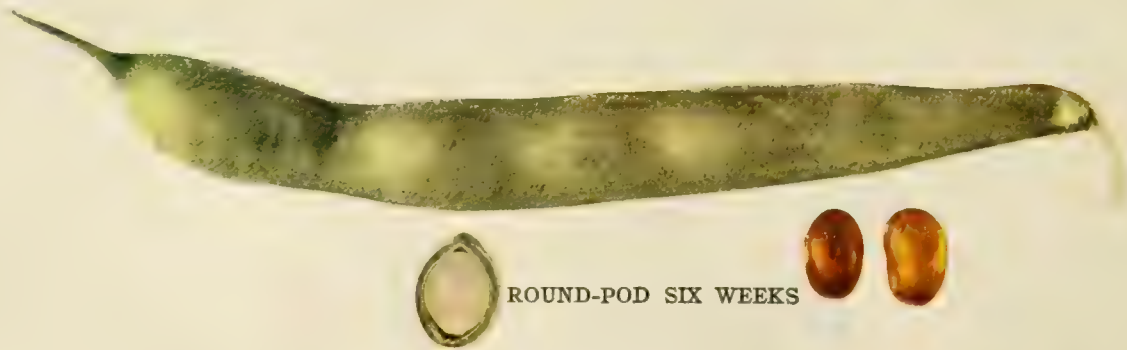
(Natural size)



GREEN GEM



BOUNTIFUL



ROUND-POD SIX WEEKS



FIRST EARLY

Gray Succession. This was a French variety that was grown at this Station in 1888, found to be intermediate in season, and productive of long, slender green pods that were not of high quality.

Plant 1 foot tall, with rather erect branches, deep green, roughened and blistered foliage, and pale purple flowers. Pods 6 to 7 inches long, slender, generally much curved, stringy and fibrous, green. Seeds 6 or 7, medium to large, oblong or slightly kidney-shaped, heavily marked blackish purple over dirty white.

Green-seeded Flageolet. Refs. 15, 16, 48, 49, 63, 97. This bean is one of the oldest known varieties grown in France, having green-tinted, slightly to much flattened, plump to slender, kidney shaped seeds. In France it is known as Flageolet a Grain Vert and as such has been known since before 1860. It probably originated as an accidental variation or sport from White Flageolet, from which it differs in points distinguishable only by careful study of foliage, pods, and with seeds showing an increase in green pigment. The pods soon become too stringy to make it an acceptable snap bean; but the green beans are of fine flavor, and attractive color when cooked or canned.

Plants as described under Triumph of the Frames. Pods borne well above foliage, dark dull green in color. Quality poor; decidedly stringy, fibrous, medium tough but rather fine in texture. Size short to medium, narrow and slender ($4\frac{1}{4}$ - $5 \times \frac{3}{8}$ - $\frac{7}{16} \times \frac{1}{4}$ inches), containing 5-6 seeds per pod. Shape oval to flat, ovate thru cross-section, moderately curved, straight backed, regular, not crowded, smooth, filled to the tip and edge, and is rounded at the end. Spurs long, moderately stout and curved. Suture, placental is rounded to flat and carpellary, obtuse. Seeds small to medium, $1.7 \times .6 \times .4$ cm, (160 per oz.) long reniform, somewhat flattened; rounded or somewhat truncate at the ends. Hilum flat to very slightly protuberant. Color greenish white (water green) over entire surface and marked with a darker shaded, vein-like under pattern.

Green Soissons. Refs. 47. Mons. Bonneman is credited with originating this variety in 1894, in which year it was introduced by Vilmorin. Tho described by Irish, it does not appear to have been grown commercially in the United States.

Plants only slightly different from those of Dwarf Soissons. Pods longer and heavier. Seeds lighter green in color and rather more plump than those of the Flageolets.

Grenell Stringless. Refs. 48, 91. This variety was one of the varieties originating with W. H. Grenell, Pierrepont Manor, N. Y., and was introduced by J. Bolgiano in 1905. The flat pods and short picking season prevented its success in competition with Burpee Stringless, Giant Stringless and Bountiful, varieties that equal it in quality and excel it in earliness.

Plants very similar to those of Red Valentine, but slightly larger, stiffer-stemmed and with rather more spreading branches; quite free from disease. Pods long, but variable, $5\frac{1}{2}$ to nearly 7 inches, round, thick, nearly $\frac{1}{2}$ inch in diameter, much curved, particularly toward tip, slightly swollen over seeds, ends long-pointed, ending in long, slender, slightly curved tips, green, brittle, stringless, with slight fiber, of good quality. Seeds 5 to 6, about $\frac{3}{5}$ inch long, rather more than half as wide, oval in cross-section, hardly plump, broad oblong, well rounded at ends, white, patterned much like Golden-eyed Wax, but eye-patch and streak over end yellowish brown or fawn, lighter than that of bean mentioned, and with less definite borders, darker greenish or brown eye-ring.

Henderson. As might be surmised, this relatively new bean originated with the firm of the same name and

was introduced by them in 1920. The parentage is not known but the seed and plant characters show a resemblance to such varieties as Full Measure, Red Valentine, Longfellow, Mohawk, and Early Refugee. There is another peculiar similarity that may show relationship; the seed of Henderson is practically identical with the seed of Golden Age which was also introduced by Henderson & Co., but two years later or in 1922. It is possible that both varieties have one or both parents in common; one variety however, produces green pods and the other wax pods.

At Geneva pods were ready for picking in 53 days or 6 days later than Tendergreen and about the same in season as Longfellow, Magpie, or Six Weeks. It is somewhat similar to Red Valentine in color of pod and length of tips but much more curved with indentations (inch marks) soon showing. These, however, are not as marked as in pods of Giant Stringless Green Pod or Full Measure. The foliage is a lighter green than Tendergreen and the leaflets are smaller and less circular in appearance.

Plant medium in size, 14 inches high with spread of 12 to 15 inches; erect, compact, vigor good, yield only fair. Stem stout, rigid, smooth; branches few, green thruout. Foliage medium, abundant, medium green, dull, crumpled, slightly rough, thick; leaflets about $4\frac{3}{4}$ inches long, $3\frac{1}{2}$ inches wide at one-fourth distance from base, with edges showing slight inward curve to rather sharp point. Flowers blush pink.

Pods borne intermediate among the foliage; light silvery green in color. Quality good; fleshy, brittle, stringless and quite fine, altho not ideal in texture. Size moderately long, narrow and plump ($5-6 \times \frac{1}{2} \times \frac{3}{8}$ - $\frac{1}{2}$ inches), containing 5-6 seeds per pod. Shape round, nearly circular to oblate in cross-section, moderately curved, slightly constricted, not crowded, smooth but occasionally marked with diagonal, silvery, blister-like markings, filled to the tip and edge and tapering on the end. Spur long, moderately stout and recurved. Suture, placental is indented and carpellary, rounded.

Seeds medium to large, $1.55 \times .65 \times .5$ cm, (65-70 per oz.), somewhat cylindrical to long reniform, moderately plump, nearly circular to broad oval in cross-section; ends abruptly rounded. Hilum medium, flat. Color intermediate between Full Measure and Longfellow, tawny yellow under color (ochraceous tawny), mottled and splashed over the entire surface with reddish brown (sanford's brown) of varying intensity.

Hodson Green Pod. Refs. 48. Sometime previous to 1905 a stray plant with green pods was found in a field of Hodson Wax by O. W. Clark and Son who are also credited with introducing the variety. It has one of the most attractive pods of any American bean; very long, practically straight, of flat type but quite plump, of good green color. Unfortunately the quality of the pods is as poor as the appearance is good.

Plants tall, $1\frac{2}{3}$ feet, with stout stems, but long, spreading branches, runnerless but secondary branches occasionally trail on the soil. Foliage moderately abundant, dark dull green, rough; leaflets very long, 6 inches, and two-thirds as wide, on very long stalks. Pods $7\frac{1}{2}$ inches long and as indicated above. Seeds of Valentine color, but showing more of light areas and red areas polished rather than dull, curved kidney-shape, about $\frac{5}{8}$ inch long, hardly half as wide, fairly plump, about 80 to the ounce.

Hoover Special. Woodruff-Boyce Seed Co. first found this growing near Seattle, Washington, and named it in 1919, for the former Food Administrator,

now President. It is said to be very hardy, so that it can be planted early and therefore furnish pods before any other greenpod bean. It is suitable for a dry shell bean.

Plant large, stout; leaflets coarse, dark green. Pods 6 to $6\frac{1}{2}$ inches long; flat, with long, tapering tips, medium dark green, undoubtedly soon stringy. Seeds large, oval, slightly flattened, white, mottled red.

Hundredfold. Refs. 47, 53, 93, 94, 98. Syn. Hundred for One. This was grown here and at the Missouri Botanical Garden; but is not now listed by seedsmen.

Plant strictly dwarf, 1 foot or less, moderately vigorous; leaflets deep green 3 to 4 inches long, 2 to 3 inches wide; considerably wrinkled. Flowers white. Pods green, 3 to $4\frac{1}{2}$ inches long, narrow, nearly round in cross-section, curved with rather long, stout, stringy and fibrous. Seeds under one-half inch, half as wide, plump, oval, often with truncated ends, bright yellowish brown with marked brown eye-ring.

Ilsenburg. Refs. 47, 93, 94. Wing considered this, an old German variety, so similar to Mohawk that he named them as identical, altho his data show that it was more than a week later and gave almost double the yield of Mohawk. Irish said it differed from Mohawk in more drab-colored seeds finely spotted with yellow. Vilmorin considered it a good "half-late" variety.

Jones Green Pod. Refs. 42. By crossing Garden Pride with Burpee Stringless, A. N. Jones secured a new strain which became the successor to Garden Pride. Maule introduced Jones Green Pod in 1906 as an all-purpose bean. It apparently never found favor and soon disappeared from trade lists.

Much earlier than Garden Pride, a stronger grower, more resistant to rust, with longer, straighter and fleshier pods and larger seeds.

King of the Greens. Refs. 16, 28, 53, 61, 80, 81. This is another of the varieties originated with Bonnemain and was introduced in the same year (1888) as Green Bagnolet. It was said to have been a selection from Wonder of France. The name is often used as a synonym for other varieties of similar type. Like other Bonnemain varieties, the leaves fall early thereby facilitating the harvesting operation.

According to Denaiffe it differs from its sister variety only in rather shorter, more branched, more compact plants, and in more regular, handsome pods.

Knickerbocker. Refs. 48, 91. Henderson introduced Knickerbocker in 1902 with the notation that it originated in Genesee Co., New York as a Red Valentine x Yosemite Mammoth Wax cross. Altho it is apparently better than Burpee Stringless, to which it was very similar, it was not able to displace that variety and soon disappeared, being carried only five years in the introducer's catalogs. According to Jarvis it "ranks about the same as Burpee Stringless in productiveness, quality and attractiveness."

Plants like those of Yosemite Mammoth. Pods like those of Burpee Stringless but decidedly larger, thicker, more constricted between beans, straighter, much curved near tip, never curved backward at stem end. Seeds oblong, more frequently truncate at ends than those of Burpee Stringless, sub-circular in cross-section, deep red or maroon in color.

Langport Wonder. Kelway introduced this variety in 1919 or before and it reached America in 1921.

Plants are of the Sutton Superlative type, more productive than Canadian Wonder, very early with pale green pods in clusters, 7 inches long, slender, straight, with comparatively short tips and necks, stringless. Seeds rather larger and more uniformly kidney-shaped than those of Canadian Wonder, horse chestnut color rather sparingly blotched by the cream under color.

Long Yellow Six Weeks. Refs. 10, 13, 15, 16, 27, 28, 29, 41, 45, 47, 48, 49, 53, 56, 66, 67, 80, 81, 91, 93, 94, 97, 98. Syns. Breck's Yellow Cranberry, Date Wax, Early Six Weeks, Gold Bean, Pride of Newton, Rob Roy. This is undoubtedly one of the very oldest bean varieties known. It is found in practically every country where beans are grown. Where it started in cultivation must remain unknown; in the United States the earliest mention is found in the earlier catalogs of American Seedsmen or around about 1825. Until its daughter variety Bountiful (1897) came along it was the favorite flat green-podded market bean. Round Yellow Six Weeks (different) and Long Yellow Six Weeks were carried together and as far as records go are of equal antiquity. They were probably grown by native tribesmen, picked up and distributed by the early explorers. Long Yellow Six Weeks has been known as the Gold Bean; according to Martens it is known in Canada as Montreal Bean, in Italy as Fagiola della regina, in France as Haricots rond printaires or Flageolet jaune, in Germany as Early Yellow Princess Dwarf, Yellow Egg, etc. Martens classed this variety under *Phaseolus ellipticus aurens*.

The pods are smaller than those of Bountiful, somewhat darker with less silvering, much tougher, and curved more in the middle rather than towards tip. The plants are smaller, more erect, with foliage darker green, altho lighter than other greenpods, with much less of the characteristic bronzing appearing on the older plants of Bountiful. It is quite different from other varieties grown during the same period Long Yellow Six Weeks was popular.

Plant medium in size, 12 inches high with equal spread, erect but rather open; vigor good, moderately productive; branches green thruout. Foliage abundant, light green; leaflets slightly rough, crumpled, large in size. Flowers bluish pink or lilac. Pods borne below the foliage; medium light green in color. Quality poor to fair; stringy, fibrous, fairly brittle when very young and coarse in texture. Size long, quite broad and moderately flat, ($6\frac{1}{2} \times 1\frac{1}{2} \times \frac{3}{8}$ inches), containing 5-6 seeds per pod. Shape flat, long ovate in cross-section, slightly curved, straight backed regular, not crowded, smooth, filled to the tip and edge and moderately rounded at the end. Spur long, slender, and moderately curved. Suture, placental is flattened to somewhat rounded and carpellary, moderately obtuse. Seeds medium to large, $1.55 \times .7 \times .55$ cm, (65-70 per oz.); moderately long reniform, somewhat flattened, oval in cross-section; ends uniformly rounded. Hilum medium to large, protuberant. Color buffy brown (pinkish cinnamon to cinnamon buff), over the entire surface, marked with a wide, slightly irregular, dark brown, (mars brown) eye-ring.

Longfellow. Refs. 36, 41, 47, 48, 49, 64, 91, 99. Syns. Emerald Beauty, Emperor of Russia, French Lead Pencil, French Market, French Stringless, Perfectly Straight Round Pod, Sutton's Perfection.

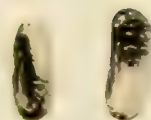


EMERALD BEAUTY

(Natural size)



MAGPIE



LOW'S CHAMPION



SUNRISE



WONDER OF FRANCE



DWARF GREEN PODS

(Natural size)

The origin and early history of this bean with its many names and synonyms, is quite obscure; but Denaiffe could detect no difference between Empereur de Russie, which is undoubtedly Longfellow and a variety long grown in Southern France known as Nain gris maraicher (Dwarf Gray Market Garden). Longfellow was brought to America in 1895 by Henderson and offered as a novelty in his catalog of that year. The appearance of the pods which are very straight, round, long tipped, and dark green, is better than the quality which is only good when the pods are quite small. The plants are lacking in vigor, hardiness, resistance to disease and productiveness. It is grown to some extent in the South where a small round pod is desired as a market bean. In season it is classed as midseason to late, 53 days, at Geneva about 6 days later than Black Valentine and Giant Stringless Greenpod or about the same in season as Triumph of the Frames. The seed differs from other varieties in the light lavender markings. In general appearance the plants are more like Black Valentine than any other, the pods are also similar in color to pods of that variety, but are shorter, rounder, and straighter with a longer, more ill defined point, less productive in yield and later in season. The foliage is quite similar to Black Valentine but the plants are more scraggly probably due to the longer branches.

Plant medium to large, 14 to 18 inches tall, spread of 12 to 15 inches; erect with rather scraggly open growth, runnerless; vigor, fair, only moderately productive during rather short season. Stem stout, round, ridged, internodes long with rather prominent nodes; branches, long outstretched, spreading, weighed down by filling pods, this accounts for scraggly appearance of plant, green thruout. Foliage medium abundant, rather dark full green, rough, slightly crumpled, medium veined, slight pubescence, thin to medium thick; leaflets $4\frac{3}{4}$ by $3\frac{1}{4}$ inches wide at $\frac{1}{3}$ distance from base, broad for length, sides curved to sharply tapering points. Flowers bluish pink.

Pods borne intermediate among the foliage; medium dark dull green in color. Quality good; slightly stringy, tender, quite fleshy, and rather fine in texture. Size long, rather narrow and quite slender ($6-6\frac{1}{2} \times \frac{1}{2} \times \frac{5}{16}$ inches) containing 5-6 seeds per pod. Shape round to oval, nearly circular to ovate in cross-section straight to slightly curved, straight backed to somewhat hump backed, regular, not crowded, smooth, filled to the tip and edge and rounded on the end. Spur long, slender and recurved. Suture, placental flat to somewhat rounded, and carpellary, obtuse.

Seeds medium, $1.6 \times .55 \times .55$ cm, (70-95 per oz.) nearly cylindrical, sub-reniform, very plump, nearly circular in cross-section; ends abruptly rounded. Hilum small, flat. Color dingy brownish red (corinthian red) of various shades, mottled and splashed with pale to deep buff (vinaceous cinnamon) over entire surface. A rather wide range of color shades is apparent with this variety.

Low's Champion. Refs. 11, 15, 16, 41, 48, 61, 63, 66, 70, 80, 91, 99. Syns. Buck's Improved, Dwarf Red Cranberry, Early Champion, New Champion, Red Cranberry Dwarf.

The bright red color and the shape of the seed of this variety very much resemble a cranberry so it is possible that Low's Champion as introduced by Aaron Low Seed Company in 1884 was only a renaming of the sort previously known as Dwarf Cranberry. It is certainly one of the oldest varieties in cultivation for it is found frequently in old lists of varieties that were included in the early trials. Rawson in 1885 listed

Champion among the novelties as did Gregory in 1885. Where the original type came from is unknown but it must have been among those plants cultivated by the Indians.

It is an excellent shell bean and is also of value as a string bean, since it has a very brittle meaty pod of inappreciable string and slight fiber. Its flavor is unsurpassed, cooked and cut it has a real "beany" taste. It remains long in the snap stage making it an attractive variety for the home garden. Some eastern canners, chiefly in Maine, are using Low's Champion to pack a cut green bean for a special trade. At Geneva it was a late to intermediate variety, 56 days to the first pods, therefore similar in season to Dwarf Horticultural, Longfellow, and Satisfaction, or 6 to 8 days later than Bountiful and about 5 days earlier than Refugee. Except in color of seed it is very similar to Warren. The plants make a larger growth and are darker in foliage than Ruby Horticultural. The pods are also larger, flatter, straighter, and lighter colored, being described as "whity-green" in one description. The pods differ from other shell beans represented as "Horts" in that the pods of Low's Champion are not splashed with crimson.

Plant medium to large, 12 to 15 inches tall with spread of about 15 inches; moderately erect, pods often touching the ground, very compact and bushy; without runners, hardy, vigorous, and moderately productive, long in season. Stem stout, round, ridged below; branches rather few, green thruout. Foliage abundant, very dark green, rather rough, slightly crumpled or wrinkled; leaflets large, long, of medium width, 5 inches long by $3\frac{1}{2}$ inches wide, quite sharply pointed. Flowers lilac.

Pods borne mostly below the foliage; very light green in color. Quality good, fleshy, very tender, inappreciable string, with very slight fiber, pod walls very thick. Size medium short, broad and moderately slender ($4\frac{1}{2}-6 \times \frac{3}{4} \times \frac{3}{8}$) containing 4-5 seeds per pod. Shape flat, long oval in cross-section, straight, hump backed, regular, crowded, filled to the tip and edge, and rounded at the end. Spur long, moderately thick and somewhat curved. Suture, placental is rounded and carpellary, moderately obtuse.

Seeds medium to large, $1.3 \times .95 \times .8$ cm, (45-55 per oz.); extremely short, broad oval, plump; ends rounded but occasionally truncate. Hilum small, slightly indented. Color very dark reddish maroon (ox-blood red) over the entire surface, increasing in intensity on the hilar surface.

Lyonnaise. As the name indicates, Lyonnaise originated in the vicinity of Lyons, France, and was introduced about 1887, reaching the United States in 1901. Tho apparently a worthy variety, it never became popular with us as in France and elsewhere. It was not only regarded as a good market variety, but was considered one of the best second early stringless beans for the home garden.

Plant dwarf, 1 to $1\frac{1}{4}$ feet tall. Foliage light green (Denaiffe says very dark), of medium size, somewhat blistered. Flowers lilac. Pods very long, slender but fleshy, round, sharply pointed and with very long, slender tips, green. Seeds 6, large $\frac{5}{8}$ to $\frac{3}{4}$ inch long, not half as wide, long oblong with truncated ends, rather flat, frequently curved sidewise or irregular, yellowish to reddish brown (coppery maroon, Denaiffe) with rather inconspicuous darker eye-ring.

Marvel of Paris. Refs. 47, 49, 59. A variety first sponsored commercially in 1892 by Vilmorin, but originated some years earlier with market gardeners near

Paris, probably coming as a selection from Black Speckled or from Solitaire. It was brought to America in 1894 by Thorburn, and carried by him for 30 years. It never won popularity here, as it did in England and France where it is still much grown for the market.

Plant much like Mohawk; more dwarf; a day or so earlier. Pods much more slender, splashed with violet red where those of Mohawk are reddish brown. Seeds decidedly smaller and more slender, more often kidney-shaped, color and markings almost identical.

Masterpiece. Refs. 53. Syns. Glory of St. Andrew. Before the advent of the refrigerator car and therefore previous to the development of large areas in the South for the growing of green produce to ship to northern markets there was a place for bean varieties suitable for forcing in greenhouses. This variety is another of the group that was used chiefly for this purpose. It was originally introduced by Vilmorin as *jaune de Perreux* about 1907. Sutton listed it in 1910 as a novelty, under the name Sutton's Masterpiece. Bunting of London, using one of the French synonyms of the variety, translated, introduced this bean as Glory of St. Andrew. After several trials he found it to be identical with Masterpiece. Webber and Don brought Masterpiece to America in 1915, and Michell listed Glory of St. Andrew in 1918.

The first pods were ready in about 52 days, or 5-6 days later than pods of Bountiful. The pods are longer, more slender but have the same silvery green color as Bountiful.

Plants are very similar to those of Bountiful with foliage perhaps slightly darker. Flower lilac. Pods are borne intermediate among the foliage; light silvery green in color. Quality good, fleshy, almost wholly stringless, quite fiberless and fine in texture, not as favorable in these respects as Bountiful. Size long, rather narrow and slender, ($6-7 \times \frac{1}{16} \times \frac{1}{4}$ inches) containing 5-6 seeds per pod. Shape flat, ovate in cross-section, straight, straight backed, moderately constricted, not crowded, smooth, filled to the tip and edge and pointed on the end. Spur long, straight and slender. Suture, placental is flattened and carpellary, obtuse.

Seeds large, $1.8 \times .8 \times .6$ cm, (60-65 per oz.); long reniform, fairly plump to somewhat flattened; ends uniformly rounded. Hilum large, flattened. Color very similar to Bountiful, light buff (cream buff) which later turns to dark tawny yellow (clay color) over entire surface; marked with a distinct broad eye-ring in two bands of different shades, light brown nearest the hilum and deep olive brown on the outer portion.

Matchless. Refs. 47, 51. This is a French variety which originated with Vilmorin before 1894; and which was praised most highly by him and others in France for its very early and great production of young pods which chefs and consumers in that country consider most necessary. Because the pods become stringy and tough later in the season, this variety never won favor in America, although the green shell beans are excellent.

Plant 1 to $1\frac{1}{4}$ feet tall. Foliage yellowish green, scarcely wrinkled; leaflets large. Flowers white. Pods 4-6 inches long, nearly $\frac{1}{2}$ inch broad, almost circular in cross-section, smooth very regular, nearly or quite straight, with slender, straight, half-inch spur. Seeds 6 or 7, white, with small black spot at each end of eye, which rarely become "butterfly" marking, nearly $\frac{1}{2}$ inch long, more than half as wide and nearly half as thick, oblong or almost kidney shaped.

Mohawk. Refs. 10, 12, 13, 15, 16, 26, 27, 45, 48,

49, 56, 59, 66, 80, 91, 96, 97, 98. Mohawk held an important place in the United States and in England for more than three-quarters of a century and is still listed by a few American seedsmen. It was cataloged by Thorburn as early as 1825 but indications are that it had been cultivated much earlier. The name Mohawk would link its early use to the river valley of that name in New York State. The long straight handsome pods mask the poor quality which they possess. Mohawk is a variety of historical importance although it may also be suitable to use as an early parent in future breeding work.

Plant very tall, erect, vigorous, and hardy, the heavy foliage withstanding light frosts. Foliage very dark green, rough but glossy, thick; leaflets of medium size, somewhat larger than those of Refugee, and broader at base. Flowers blush pink. Pods $5\frac{1}{2}$ to $6\frac{1}{2}$ inches long, nearly $\frac{3}{4}$ inch wide, long-ovate, thinning rapidly toward ventral edge, later becoming broad ovate or almost long oval, straight or occasionally slightly curved toward tip, latter short, rather heavy, rigid, almost straight from about middle of short-pointed end of pod, long-necked, dark green, sometimes with faint brownish or purplish lines, thin-fleshed, coarse-textured, soon tough, very stringy, fibrous, of poor quality.

Seeds 5, about 55 to 65 to the ounce, occasionally 6, about $\frac{5}{8}$ inch, nearly half as wide, one-third as thick, rather narrow oval in cross-section, oblong, very slightly ovate, with eye-side only slightly straighter than dorsum, ends well-rounded, very seldom truncate; light faintly purplish cream or purplish light brown almost wholly covered with patches of deep purplish brown, both colors darkening with age to produce a dark brown or blackish bean with lighter brown areas.

Negro Long-pods. Refs. 47, 51, 93, 94. This old variety is said to be of German origin; we are not able to identify it in Martens *Die Garten Bohnen* (1860) but our earliest reference to it is German. It has disappeared from American catalogs; but as it is still grown in several European countries, seed of it was secured for trial here. It gave us the longest pods of any kidney bean with the exception of The Prince, which exceeded it by about half an inch, mostly due to longer tip.

Plant not over 1 foot tall, tho usually described as one-fourth to one-third taller, very late. Stem stout, many spreading branches and many short runners; leaflets small, narrow, taper-pointed, almost smooth, light green. Flowers pink. Pods single, on long, rather heavy stalks, 8 inches or more long, about $\frac{3}{8}$ inch broad, very slender, ovate in cross-section, slightly curved, very long S-shaped, with long-pointed end and $\frac{1}{2}$ to $\frac{3}{4}$ inch, fairly heavy, rigid curved tip. Seeds $\frac{1}{2}$ inch or more long, about 95 to the ounce, oblong, or curved kidney shape, quite plump, shining black.

New Stringless Green Pod. A new variety introduced in 1930 by the Associated Seed Growers. It is the result of careful breeding using known varieties as parents and careful selection to perfect the better hybrid. The parents used in the cross were Full Measure and Keeney's Stringless Green Refugee. Only after twelve years work was the stock considered fixed to warrant its introduction. This variety has pods of fine quality and should be worthy of trial for both truckers and canners. It is hardier than Full Measure and its season is very concentrated, producing the pods abundantly and nearly all at one time.

Pods light to medium green. Quality excellent, very meaty, stringless and without fiber, texture fine. Size long, medium

broad, plump ($6\frac{1}{2} \times 5\frac{1}{8} \times 5\frac{1}{8}$ inches) containing 5-6 seeds. Shape round, circular in cross-section, slightly curved, straight-backed, regular, filled to tip and edge, end pointed. Spur medium long, thick and recurved. Suture, placental is slightly indented and carpellary, rounded to broadly acuminate. Seeds resemble those of both parents, when freshly harvested color is more like Refugee but with age the purple darkens and the brown of Full Measure is present.

Newington Wonder. Refs. 13, 51. Syns. Brown Date Bean. This English variety originating about 1850, was noted in the U. S. Commercial Agr. Rept. p. 536 of 1855 and was said by Robert Thompson to be "the best variety of kidney beans." It reached America very soon after and for fifty years or more was grown to a limited extent. The pods of this old variety were of poor quality, tough and stringy when full grown. The seed greatly resembles that of Giant Stringless Green Pod and therefore it appears that Newington Wonder has been known as a synonym for that variety. The old variety is still used in England since it appears in trials as of 1909 and later.

Plant very dwarf, spreading with some runners and abundant dark green, fine, smooth, foliage. Pods green soon changing to pale yellow often almost entirely covered with reddish purple, short, broad, straight, crisp and tender when young; and, if kept picked continue to form over a long season, making the variety very productive. Seeds small, oblong or slightly kidney-shaped, decided truncate, light brown, dun-colored, or pale brownish drab with faint yellowish eye-ring.

Osborn. Refs. 47, 51, 53, 85, 94, 98. A first class certificate was conferred upon this variety in 1873 by the Royal Horticultural Society. This was also the year of its introduction. Irish considered it identical with Emile for they were undoubtedly of the same horticultural use and value. At Geneva pods of Osborn were longer and straighter, splashed with purple, and more stringy; while the seeds were narrower in proportion to their length, often slightly kidney shaped and differed in color from those of Emile in being brown or blue black rather than brownish purple. In tests here in 1883 Osborn was three days later than Emile and slightly more productive.

Perpetual. Refs. 51, 53. This bean was introduced by Carter before 1913 and was listed in his American catalogs. It was grown in the trials at Geneva and noted as exceedingly similar in plant and pod to Cream Valentine.

Pods slender, longer and only two-thirds as wide as Cream Valentine. Quality stringy but without parchment, fine texture. Seeds 6, slightly more pink than those of Cream Valentine, and often truncate at the ends from compression in the pods, the contact between the beans resulting in small flattened areas of dark brown which contrasted noticeably with the body color and were usually darker than the eye-ring.

Pheasant-eye. In 1910 this variety was listed as new by Rahe Seed Co. and was said to have come from a single plant found in a row of Bountiful and to have all the good points of that variety with added symmetry of pod.

Plants rather inferior to those of Bountiful. Pods of rather better color, ready later, therefore flatter when pods of the same size were compared; stringless, but rather thin-fleshed. Seeds of same size and shape as those of Bountiful, dull veiny white, blotched

about eye and toward one end with yellowish brown, changing to light brown or reddish brown with band of same color over other end and spots irregularly distributed near margins of patches.

Prince. Refs. 53. This is the result of a cross between Superlative and Perfection introduced by Sutton in 1927 and in the United States in 1929 by Walter. Because of the very long, straight, dark green pods this variety has possibilities as a forcing and home garden bean. A late variety ready for picking in 54 days at Geneva. Prince in our trials proved to be one of the longest podded varieties grown; plant is vigorous but smaller than Superlative, the pods are longer and rather shorter tipped and the seeds somewhat similar to the Henderson but with more red.

Plants somewhat smaller than those of Superlative, vigorous, healthy, with dark green foliage. Flowers blush pink. Pods borne intermediate among the foliage; light, medium, waxy green in color. Quality fair to good; brittle, nearly stringless, fiberless but rather coarse in texture. Size long, medium broad and fairly slender ($7-8 \times \frac{7}{16} \times \frac{5}{16}$ inches), containing 6-7 seeds per pod. Shape flat, ovate in cross-section, slightly curved to much curved, straight backed, regular, not crowded, filled to the tip and edge but not towards the stem tip and pointed at the end. Spur long, slender and recurved. Suture, placental is flattened and carpellary, acute. Seeds large, $1.8 \times .7 \times .55$ cm (50 per oz.); decidedly long reniform, somewhat flattened; ends uniformly rounded. Hilum large, flat but somewhat curved. Color dark buff (cinnamon rufous orange) under color, almost entirely covered with dark reddish-brown (claret brown) mottling.

Prolific Pickler. Refs. 41, 48. This bean was grown by some German gardeners near Rochester, N. Y., for some time before it was listed by Vick in 1894. It was exceedingly like Canadian Wonder, but with much longer pods; but very productive.

Pods more than 8 inches long, flat, much constricted between seeds, stringy, tough and of poor quality, but useful in early stages for pickling. Seeds 7 or 8, more than $\frac{3}{4}$ inch long, half as wide, flat, much like a long Lima bean in shape, plum violet in color.

Purple Pod. Refs. 28, 49, 93, 94. Syns. Blue Pod Butter. Since there is no known reference to the appearance or use of this bean among the early settlers it probably is of European origin. There is a climbing Purple Pod which is a very old French variety and which in all characters except climbing habit resembles the variety introduced to this country in 1888 by W. Atlee Burpee. This Purple Pod Dwarf or Bush supposedly came from Germany. This bean is little known or planted except by home gardeners, or by some who favor it as a pickling bean. A second early, ready in 50 days at Geneva. In color of foliage this variety is unlike all others. The pod is shorter, broader, flatter than pods of Bountiful, perhaps more like pods of Imperial Wax in general shape.

Plant medium, about 15 inches tall with equal spread, a true bush, erect but with growth rather scraggly, no runners but some long branches that sag down with weight of pods; rather vigorous in growth but not overly productive and of short bearing season. Stem stout, thick with short internodes, more or less purple tinged, especially at nodes; branches few, squared, ridged, purple coloring at nodes and flower stalks. Foliage abundant, quite dense, dark green with purplish cast, dull, crumpled but smooth, medium veined, medium thick, pubescence heavy; leaflets 4 inches long with width of $3\frac{1}{4}$, the greatest width is at base, base line very nearly straight, terminal leaflet triangular with sides straight, tapering uniformly to point. Base leaflets shorter, $2\frac{1}{2}$ inches long by 2 inches

wide, quite unequal sided. Side of mid-vein nearest terminal leaflet nearly twice as wide as far side, base is angled, mid-vein angled toward terminal leaflet, giving leaf quite an odd shape, sometimes described as rolled backwards; tips short, wide. Flowers phlox purple, the upper part or back of the "Standard" very dark purple black.

Pods borne both intermediate and below the foliage; dark dull greenish purple in color. Quality good, brittle, fleshy, occasionally somewhat stringy, and fine in texture. Size long, broad, and rather slender ($6\frac{1}{2} \times \frac{3}{4} \times \frac{1}{4}$ inches), containing 5-6 seeds per pod. Shape flat, elliptical in cross-section, straight, straight backed, regular, not crowded, smooth, filled to the tip and edge and rounded on the end. Spur long, slender and straight. Suture, placental flat to slightly indented and carpellary, acute.

Seeds medium, $1.4 \times .7 \times .45$ cm, (105 per oz.), oval to occasionally sub-reniform, oval in cross-section, somewhat flattened to fairly plump; one end rounded and the other somewhat truncate. Hilum medium, flattened. Color light buff (pale pinkish buff) over entire surface marked with a rather prominent, darker shaded, vein-like under pattern and a narrow two-toned tawny yellow (tawny) eye-ring.

Rachel. Refs. 47, 56, 97, 98. This old bean is supposedly of American origin. It was included in the trials at Geneva in 1882 but has not been listed in American catalogs during the present century, nor was it described by Tracy or Jarvis, tho included by Irish.

Plant 1 to $1\frac{1}{4}$ feet tall, vigorous, making compact bush; foliage abundant, light or yellowish green; leaflets 3 to $3\frac{1}{2}$ inches long, $2\frac{1}{2}$ to 3 wide, not wrinkled. Flowers white or faintly blushed. Pods $4\frac{1}{2}$ to $5\frac{1}{4}$ inches long, nearly $\frac{1}{2}$ inch wide, oval in cross-section, somewhat swollen by beans, straight or nearly so, quite blunt at ends, with short, slender curved tips from dorsal edges, green, occasionally lightly streaked violet. Seeds oblong or kidney-shaped, slightly more than $\frac{1}{2}$ inch long, more than half as wide and nearly as thick as wide, dark chocolate brown nearly covering bean, with small, irregular whitish area on end toward point of pod, usually less than one-eighth surface.

Reliance. Refs. 48, 51, 53. Sutton introduced Reliance in 1903; it was given an Award of Merit the same year by the Royal Horticultural Society, and considered by them to be an improvement over Ne Plus Ultra.

Plant very vigorous, hardy, quite disease-resistant, early, and moderately productive. Pods large, $5\frac{1}{2}$ to 6 inches long, slender, ovate in cross-section, straight, with pointed ends and prominent tip, attractive, light green, stringy, tough but fine-grained and of fair quality. Seeds 6-7, oblong $\frac{5}{8}$ inch long, half as wide, often truncate, nearly circular in cross-section, olive yellow, with darker eye-ring.

Red Flageolet. Refs. 47, 53, 97, 98. This old French variety is almost indistinguishable from Canadian Wonder but its seeds are slightly lighter in color, smaller and relatively greater in length. The varieties, however, are undoubtedly of distinct origin. Red Flageolet in France, where it is most grown, is prized mostly for green shell beans; but it is equally useful with Canadian Wonder as an early snap bean. The seeds vary considerably in color, which, as well as the popular misconceptions of the colors, crimson, scarlet, and red, accounts for the many synonyms of the variety.

Red Valentine. Refs. 9, 10, 12, 13, 15, 16, 19, 20, 25, 26, 28, 29, 38, 41, 46, 47, 48, 49, 50, 53, 55, 57, 58, 61, 63, 66, 67, 68, 80, 81, 84, 87, 91. Syns. Early Speckled Red Valentine, Early Wonder Red Valentine, Lightning Early Red Valentine, and over 50 other

names differing in the arrangement of the adjectives early, extra early, improved, red, red speckled and round podded.

Valentine is an American variety known at least since 1832, for it was then cataloged by Landreth's as Extra Early Red Valentine. It was reported as originating near Philadelphia; but Burr, in 1863, says it had "long been grown in England and other parts of Europe and was common to gardens in almost every section of the United States. Denaiffe reports it as an "old American variety introduced into France in 1889." It was probably flat podded and stringy in its early days, but by Burr's time its pods were "almost cylindrical," tender and very fleshy, remaining long on the plants without becoming hard and tough. To maintain and, possibly, to improve the variety has been the constant aim of breeders; and their steps toward these ends, often merely sidewise rather than forward, have resulted in the multiplicity of synonyms shown in our references, and nearly as many more combinations have been omitted. So varied are the listings that it is exceedingly difficult to say how many seedsmen offer the variety, but it is undoubtedly as in Burr's day and in Tracy's one of the most popular garden beans, tho far less grown for market than Black Valentine. Varieties with larger pods and better quality have gradually replaced Red Valentine notable Burpee's Stringless Green Pod, Full Measure, Giant Stringless Green Pod, and Bountiful.

There have been and are many strains of Red Valentine that are favored in certain sections, Improved Early Red Valentine (Hopkins) has long been popular. Landreth introduced in 1930 a new stringless strain as Landreth's Extra Early Stringless Red Valentine, a full description of which occurs in the 1931 catalog. Red Valentine has long been a favorite for growing in the Southern States owing to its hardiness and good keeping quality which factor makes it a suitable bean for shipping long distances. It is a very reliable sort, making a crop under quite adverse conditions on all soil types. The pods are produced in clusters and held up well off the ground. It was formerly used to some extent in canning, but since the pods pass thru the canning stage rather quickly, with the seeds taking size rapidly, it has been replaced by the newer varieties. The pods are rather too short and too much curved for best market garden use.

At Geneva it was a second early, the pods were pickable in from 49 to 52 days. This makes Red Valentine about 3 days later than Stringless Greenpod or Bountiful and the same in season as Full Measure and Early Refugee. It was less productive with us than Refugee or Full Measure; the same in season and usefulness as Early Refugee, but the pods were more meaty and of better quality; the vines more erect and more open in habit. The plant is smaller than Black Valentine, pods are shorter, more curved, but much thicker, more tender, and with less string and parchment. Pods are not so thick as those of Full Measure, but are shorter and more curved. The wide marks or indentations

between beans common to pods of Stringless Greenpods and Full Measure are not found in Red Valentine.

Brown Speckled Valentine, Cream Valentine, Giant Valentine, and White Valentine, are all different types.

Plant small to medium, commonly under 1 foot tall, but under good growing conditions 12 to 14 inches high with spread of $\frac{3}{4}$ to 1 foot; very erect, tree like, compact, yet not dense, runnerless; vigor fair, very hardy, moderately productive over moderate season, few pods occasionally appearing above foliage. Stem in some strains somewhat slender, generally, however, stout and rigid, round below first node, above somewhat ridged, short jointed; branches few without secondaries, green thruout. Foliage moderately abundant, not dense, medium green to light green in color, surface dull rather than glossy, rough, slightly crumpled, medium veined, medium in thickness; leaflets somewhat like those of Refugee, but larger, about 4 inches long by $2\frac{3}{4}$ inches wide, appearing narrow because widest near base and tapering rapidly to rather sharp points. Flowers white.

Pods borne intermediate among the foliage; medium dark dull green in color. Quality very good; fleshy, tender, somewhat stringy, practically fiberless and medium fine in texture. Size medium long, moderately narrow and slender, more slender than Stringless Green Pod, ($4\frac{1}{2}$ -5 x $\frac{3}{8}$ x $\frac{3}{8}$ inches), containing 4-5 seeds per pod. Shape round, nearly circular in outline, curved, often creasebacked, quite regular, somewhat crowded, smooth filled to the tip and edge and rounded at the end. Spur long, slender and straight, occasionally slightly recurved. Suture, placental slightly indented and carpellary, rounded.

Seeds medium, 1.4 x .7 x .65 cm, (70-90 per oz.) long oval, plump, some strains more cylindrical than others; ends rounded and occasionally one slightly larger than the other. Hilum small, rounded. Color light fawn (vinaceous cinnamon) blotched over 95 per cent of the surface with varying shades of dull red (vandyke to acajou red).

Refugee. Refs. 9, 10, 11, 12, 13, 16, 19, 29, 38, 41, 47, 48, 49, 61, 63, 77, 91, 93, 96, 97, 98, 99. Syns. Brown Speckled Valentine, Improved Refugee, Late Refugee, Late Prolific Refugee, Round Pod Refugee. This very old bean has been grown in the United States at least since 1822 for it was listed that year by J. M. Thorburn & Co. Taking all of the many named forms of the Refugee it is not out of order to say that it is one of the most widely grown of the green-podded beans. Its origin is not definitely known and as it is grown wherever beans are used as food its beginning must remain obscure. Martens suggested that it probably was brought to England or to America by the French Huguenots or "Refugees," for whom it may well have derived its name. It is exceedingly similar to Suisse gris which is one of the oldest French types. Martens described it as Turkish Date Bean and according to the same authority it is called by the Missouri Indians Ohmenik Pusaehna; on the Bourbon Island, Haricot lilas vert; in Algiers Haricot noir and Haricot de Bagnols; in Lisbon Haricot bleu; in Venice Fasioni favaroni; in Lousanne and Paris Haricot suisse gris, and Haricot gris de Bagnols; in Germany Variegated Dutch.

In order to counteract the tendency of Refugee toward flat-podded types, various seedsmen during the latter part of the past century and the early part of the present, made selections for round stringless pods. In one of these, at least, distinctly larger pods have been secured, reaching nearly 6 inches in length and nearly

half an inch in diameter, but late in season, less productive and soon showing strings; another strain produces pods one-fourth less in diameter, and almost wholly stringless; yet another is identical with the Excelsior strain of Extra Early Refugee, but nearly two weeks later. N. B. Keeney is credited with selecting and introducing the stringless type of Refugee from which has been derived all of our later Stringless types.

Refugee has always been the leading green-pod planted to produce late snap pods. It has also been largely used by southern planters for shipment to northern markets. The small size of the pods and color of seed prohibit its use as a shell bean. After the introduction of the stringless podded type Refugee soon became the leading bean used for canning. The straight, uniform, absolutely fiberless pods have an excellent color and the smaller sizes are suitable for whole bean packs. The pods pass through canning stage slowly and prominent seed development is retarded. A late variety, 58 to 62 days at Geneva, this is 10 days later than Early Refugee, Refugee Wax, Round Pod Kidney Wax, or Bountiful, 12 days later than Full Measure and 15 days later than Burpee's Stringless Green Pod.

Plant large, 14 to 18 inches high, with spread of 15 to 18 inches; strictly dwarf, erect, very spreading in rows, but not scraggly, compact; some indeterminate shoots appear and some branches are tendril-like, but the plant can be said to be without runners; very good vigor, heavily productive over a long season, if early growth conditions are unfavorable the plants often will produce a good crop later. Stems stout, round, smooth, ridged above, internodes short; branches many, secondary branches numerous, continuing growth very late, green thruout. Foliage very abundant, dense, medium to dark green, bright or glossy; surface smooth, thin, very slight pubescence or veining; leaflets readily distinguishable from those of other varieties, small, $4\frac{1}{2}$ inches long by $2\frac{1}{2}$ inches wide, long, slender, elongated inclined to diamond shape, and taper-pointed. Flowers phlox purple.

Pods borne below foliage, light, pale green in color. Quality good; brittle, without strings, very small amount of fiber and fine texture. Size medium long, broad and quite plump, ($5\frac{1}{2}$ -5 x $\frac{3}{4}$ x $\frac{5}{16}$ inches), containing 5-6 seeds per pod. Shape round, nearly circular in cross-section, straight-backed, straight but occasionally slightly curved, regular, filled to the tip and edge, smooth, not crowded and is rounded or tapering at the end. Spur long, slender and slightly recurved. Suture, placental is slightly indented and carpellary, rounded to obtuse.

Seeds medium 1.4 x .6 x .6 cm (97 per oz.), quite straight, cylindrical in middle tapering somewhat to ends, plump; ends uniformly rounded. Hilum small, flat. Color very light brown or dun (light vinaceous-cinnamon), splashed and mottled over entire surface with dark maroon purple (blackish red-purple).

Rhode Island White. Refs. 15, 49. A variety introduced by Gregory sometime between 1885 and 1888, and which had been grown in the region about Portsmouth, R. I. for some years. It was said to be the earliest snap bean known, of first class quality and very productive.

Rob Roy. Refs. 13, 47. Rob Roy is a very old variety and is so similar to Long Yellow Six Weeks that it is often considered identical with it; but the two appeared to have had constant, although slight, differences. The use of both varieties and the general growth habits are the same.

Plant of Six Weeks runnerless, those of Rob Roy with numerous short, barren runners; pods of Rob Roy shorter, yellowish becoming white with age; seeds of Six Weeks more or less fawn or tan when fresh, those of Rob Roy clear cream or yellowish, and broad oval, rather than kidney-shaped.

Round Yellow Six Weeks. Refs. 6, 9, 12, 13, 16, 25, 27, 29, 41, 47, 48, 49, 61, 66, 84, 91, 93, 94, 98. Burr described this variety in 1865 stating that it had been grown in this country for more than a century. It is, therefore, a companion variety in point of age with Long Yellow Six Weeks. Its seeds resemble the seed of the Chilean Bean, Bayos chicos. This leads to the conclusion that it was brought from that country, "round the Horn" in the early days of American shipping. Round Yellow Six Weeks is a fairly reliable sort but does not have the necessary good qualities to rate as a leading garden variety. It is quite hardy, a good cropper with pod flavor richer than most sorts. A second early, 51 days to first pods, or 4 days later than those of Bountiful. It is somewhat similar in general habit to Bountiful but the foliage is not so light colored and is less coarse. The pods are quite different from those of Long Yellow Six Weeks as they are less curved, shorter, more narrow and much rounder in cross-section. The foliage is also finer and more compact. In some ways it resembles China Red Eye but is a smaller, more open plant with lighter foliage and with pods of better quality. Other names that are synonyms of Round Yellow Six Weeks are mostly variations of arrangement of the descriptive terms early, round, yellow, six, and dwarf.

Plant small to medium 10 to 14 inches tall with spread of 1 foot; erect, compact, runnerless; vigor good, moderately productive with bearing period moderately long. Stem slender, branches few, wholly green. Foliage rather abundant, light green, smooth surface, crumpled; leaflets medium to small, $3\frac{3}{4}$ inches long, $2\frac{1}{4}$ inches wide nearest base, tapering to long slightly curved point, base of leaflet curved to quite rounded. Flowers lilac. Pods borne intermediate among the foliage; light, moderately glossy green in color. Quality good; stringless, almost fiberless, fleshy, brittle and moderately fine in texture. Size long, rather broad and moderately slender, ($5\frac{1}{2}$ – $6\frac{1}{4}$ x $\frac{1}{8}$ x $\frac{3}{8}$ inches), containing 6–8 seeds per pod. Shape flat, oval in cross-section, moderately curved, straight backed, regular, fairly well crowded, smooth, filled to the tip and edge and pointed at the end. Spur long, straight and slender. Suture, placental is flat and carpellary moderately obtuse.

Seeds medium, $1.5 \times .8 \times .6$ cm, (80–85 per oz.) oblong to long oval, occasionally sub-reniform, fairly plump altho at times somewhat flattened; ends uniformly rounded. Hilum medium in size, flat. Color solid (straw yellow) later turning to a light copper (pinkish cinnamon) shade, distinctly marked on the younger seed with a darker yellowish-brown (vinaceous-buff) vein-like system over the entire surface; a narrow, yellowish brown (sanford's brown) eye-ring is present in all instances.

Satisfaction. Refs. 53. This sort was first offered in 1918 by Sutton and won an award of merit from the Royal Horticultural Society the next year. It was developed as the result of a cross between Superlative and Masterpiece and was offered in the United States in 1926 by Hunt and others. The straight dark green pods made a good appearance for exhibition, the plants are hardy, probably most suitable as a forcing bean or where the high quality of the young pods is known. The pods are ready in from 53–55 days. It is less vigorous

than the parents, with pods broader than Superlative and of a darker green than Masterpiece. In foliage it is very similar to Feltham Prolific.

Plant erect, runnerless, vigor good, yield fair. Foliage medium abundant, medium dense, very dark green, crumpled, rough, thick, heavy veined. Flowers white cream with age. Pods borne intermediate among the foliage; dull light green in color. Quality fair; moderately fleshy, fairly brittle, rather stringy and fibrous and coarse in texture. Size long, rather broad and slender, ($7-8 \times \frac{5}{16} \times \frac{1}{4}$ inches), containing about 7 seeds per pod. Shape flat, ovate in cross-section, straight to moderately curved, straight backed, regular, not crowded, smooth, filled to the tip and edge and pointed or tapering at the end. Spur long, moderately slender and straight. Suture, placental is flat to slightly indented and carpellary, moderately acute.

Seeds small to medium, $1.3 \times .6 \times .45$ cm, (90–95 per oz.); long reniform, fairly plump, oval thru cross-section; ends abruptly rounded and occasionally truncate. Hilum medium, flattened. Color pattern, style very similar to Superlative. Medium dark brown (snuff brown) over $\frac{4}{5}$ of the surface and patterned with snowy white on a portion of one end, sides and dorsal surfaces; division line between the two colors is very irregular and in many instances spotting occurs in the white area.

Shah. Refs. 53, 81, 85. Vilmorin introduced Shah in 1890, and it was brought to America in 1892. As used by the French chefs it was the best bean up to its time for the production of the long, slender, green, young pods. After a time it was surpassed by Dwarf Parisian, introduced several years later.

Plant strictly dwarf, but tall ($1\frac{1}{2}$ feet or more) holding the very long pods well off the ground; branches and foliage rather scanty; latter very large, dark green, smooth. Flowers lilac. Pods 6 to $6\frac{3}{4}$ inches long, about $\frac{1}{2}$ inch wide, slender, nearly round in cross-section, fleshy, slightly swollen by beans, slightly and regularly curved, with rather long, slender but rigid, curved tip, green stringy and fibrous. Seeds about $\frac{5}{8}$ inch long, $\frac{1}{4}$ inch wide, and nearly as thick, oblong or kidney shaped, sub-cylindrical, with round or slightly truncate ends, slightly unlike in width, black.

Sir Joseph Paxton. Refs. 47, 53, 94. This bean, named for the celebrated English Botanist and Editor of Paxton's Magazine of Botany, originated in England about 1870, and has been grown to some extent in the United States. The best American description is that of Irish, altho he makes seed color rather dark. It is moderately early and very productive; but the pods are too short to be desirable for snaps.

Plant strictly dwarf, $1\frac{1}{2}$ to $1\frac{1}{4}$ feet tall, erect, bushy; leaflets medium to small, nearly as broad as long, scarcely wrinkled. Flowers bluish. Pods green, 4 to 6 inches long, about $\frac{1}{2}$ inch wide, straight or slightly curved, with short, stout nearly straight tip. Seeds almost $\frac{1}{2}$ inch long, rather more than half as wide, oblong or nearly cylindrical with rounded ends, shining red or dark tan.

Solitaire. Refs. 13, Martens gives this name as a synonym for Mohawk; however, this variety is quite distinct, being much later in season. It was an old French variety, described by Burr but probably not grown commercially in America. It was discarded in France toward the end of the last century.

Noteworthy for very large plants, $1\frac{1}{2}$ feet tall, with very long, spreading branches, but not viny; foliage abundant, fine, light green. Pods are like those of Marvel of Paris and the seeds like those of Refugee. Nearly two weeks later than Mohawk but picking over a much longer season.

Sunrise. Refs. 53. Originating as the result of a cross between Ne Plus Ultra and Perpetual, Sunrise

was introduced by Carter in 1913 and received an Award of Merit from the Royal Horticultural Society. It was tested here recently and found early and very productive.

Plants very much like those of some of the strains of Bountiful but with finer, rather darker, almost glossy foliage. Pods of very similar shape but half an inch or more shorter, and stringy, though brittle, fine textured and of fine quality in early stages. Seeds much like those of Giant Stringless, smaller because more slender, and clear brown, darker than Giant, lighter than Burpee Stringless.

Superlative. Refs. 51, 53. Syn. Magpie. This variety is probably of French origin, altho it was introduced by Sutton in 1909. Its introduction and use in this country is more complicated due to its similarity with Magpie which was introduced from France in 1913 by Carter. The two as now found are identical. They have been offered as forcing beans because of good yield and strong plants. The pods are of good size, attractive in appearance, and of good quality when young, but with both string and parchment when older. Like most of these so-called forcing beans it is a late variety, 53-55 days, or about 10 days later than the earliest sorts, in season with Satisfaction, Wonder of France, and 5 days earlier than Refugee.

Plant large, 15 to 18 inches tall with 15-inch spread; very erect, completely runnerless and somewhat open in habit; vigor good, moderate yield over long season. Stem stout, round, ridged below, short internodes; branches few, holding pods well off ground, green throughout. Foliage medium to abundant, dark green, rather coarse, crumpled, rough, thick heavy veining; leaflets $3\frac{3}{4}$ inches long, $2\frac{3}{4}$ inches wide with widest part $\frac{1}{4}$ inch from base, sides straight with gradual slope to tip. Flowers white, cream with age. Pods borne above foliage, dull, light green in color. Quality fair, fairly brittle, partially stringy and of coarse texture. Size long, fairly broad, and somewhat plump ($7-8 \times \frac{5}{16} \times \frac{7}{16}$ inches), containing 6-7 seeds per pod. Shape, pod is nearly round, broad oval in cross-section, slightly curved, straight backed, regular, not crowded, smooth, filled to the tip and edge, and is pointed or tapering at the end. Spur long, moderately slender, and straight, Suture, placental is flat to slightly indented and carpellary, obtuse.

Seeds small to medium $1.3 \times .6 \times .5$ cm (85 per oz.), slender, long reniform, quite plump, rounded ends. Hilum small, flat to very slightly protuberant. Color shining jet black over four-fifths of the surface and patterned with snowy white on a portion of one end, sides and dorsal surfaces; division line between the two colors is very irregular and in many instances black spotting occurs in the white area. In this respect very similar to Satisfaction.

Taylor Green Pod. Refs. 48, 91. This bean originated in Oldham Co., Kentucky, presumably with a Mr. Taylor, several years before it was introduced by Wood, Stubbs & Co., in 1902.

It was exceedingly like Round Yellow Six Weeks, but with smaller, low-growing, very compact plants and darker foliage, a few days earlier, and bearing somewhat flatter, shorter pods, with much smaller, very short oval. Seeds approaching spherical.

Tender Pod. A very distinct variety, apparently of foreign origin, locally grown by market gardeners in northern California for several years, and listed by Morse in 1920. It was grown in trials here for three seasons, but apparently is unknown elsewhere except about Placerville, California, where it is grown commercially. This bean was introduced only after very careful preliminary testing yet its popularity only lasted a few years and it is no longer carried, possibly

due to the pods which were rather too flat for use as snap pods.

Plant about 1 foot tall, stout-stemmed, somewhat spreading, with abundant, medium sized, dark green foliage; flowers bluish pink. Pods almost straight, broad, nearly as long as those of Bountiful, with short, thick, but flexible tips, attractive, waxy light green, stringless, fine-textured and of excellent quality. The seeds, when old, might be taken for small samples of Burpee Stringless, but when fresh are reddish or purplish brown in color, faintly mottled over entire surface with lighter brown. The small size and purplish tint enable separation of seeds from Burpee Stringless, and the size and brown color from Low Champion or Warren.

Tendergreen. This variety was first introduced by Peter Henderson & Co. in 1922. The parentage is unknown as indicated in a letter from the concern written in 1929. The seed of Tendergreen resemble in pattern those of Early Refugee, Mohawk, Red Valentine, Longfellow, and Full Measure. They have some characters in common with each of these varieties, yet are truly different in the combination of colors. About this same period Henderson also introduced two other new varieties, Golden Age (Wax Pod) and the Henderson. Inspection of the seed and plants of these varieties together with Tendergreen would indicate their close relationship and the possibility of their coming from the same original cross. One of the parents used must have been a wax pod to account for the wax pod Golden Age. Since this is a variety with pods of good quality it would appear to merit a trial for either home garden or market use. There is a tendency on the part of growers to plant more of the round podded varieties and less of the flat pods. Tendergreen is already ten years old and is beginning to be known and is making friends wherever grown. At Geneva 47 days to the first picking, therefore, it is an early sort, in season with Bountiful and Stringless Green Pod; 2 days earlier than Full Measure, and 4 days earlier than Red Valentine. The plant characters resemble those of Full Measure in many ways, especially in the size and shape of the leaflets which are also much larger than found in other greenpods. The pods are longer than those of either Full Measure, Stringless Green Pod or Red Valentine although they are narrower in width, one noticeable characteristic is that the pods are thicker from side to side than from placental to carpellary sutures.

Plant large, 14-15 inches tall with spread of 12 inches; very erect, compact growth, entirely without runners, vigor good, heavily productive over a short season. Stem very stout, rigid, round, smooth, ridged above, internodes short; branches heavy, rigid, spreading, green throughout. Foliage abundant, rather dense, medium green, crumpled, slightly rough but glossy, thick; leaflets large, 5 inches long by $3\frac{3}{4}$ inches wide, quite circular in appearance, being widest nearer the middle with rather short point. Flowers phlox pink.

Pods borne below the foliage; dark dull green in color. Quality excellent; fleshy, brittle, tender, stringless, fiberless and of fine texture. Size medium to long, rather broad and plump, ($4\frac{1}{2}-6\frac{1}{2} \times \frac{3}{8} \times \frac{3}{8}-\frac{7}{16}$ inches), containing 5-7 seeds per pod. Shape round, nearly circular to broad oval in cross-section, slightly curved, straight-backed, regular, rather crowded, smooth, filled to the tip and edge and pointed or tapering at the end. Spur long, medium thick and curved — quite flexible. Suture, placental is slightly indented and carpellary, rounded to obtuse.

Seeds medium to large (1.5 x .75 x .5 cm, 65 per oz.), oblong, sub-reniform, plump; ends abruptly rounded to truncate. Hilum small, flat, portion of placental suture often adhering to it. Color varying in intensity of brownish black over greater portion of the surface, mottled and blotched with light fawn (vinaceous-buff) which later turns to a darker shade (cinnamon-rufous).

Tennessee Green Pod. Refs. 41, 48, 91. Syns. Brown Bunch, Fields First Early, Knife Blade. This bean was introduced in 1904 by D. M. Ferry with the notation "Although new to the seed trade, it has for many years been grown in the south," now nearly thirty years later it is quite generally listed by both southern and northern seed houses. In 1907 Henry Field listed it as Fields First Early and at least since 1923 the Springfield Seed Company has carried both Tennessee Green Pod and Knife Blade. Since this variety is quite distinct from other North America beans, it probably was brought to this country by some new settler.

In the South it is used as an early home garden variety. Pods are ready to pick in about 47 days, making this one of the earliest varieties in our trials. It is in season with Bountiful and Stringless Green Pod and earlier than Full Measure and Black Valentine. The general growth habit is somewhat similar to the varieties Emperor William and Early Market, but the plants have somewhat darker foliage and branches that are more spreading. The foliage color also resembles some of the French Green Seeded sorts, in particular Dwarf Soissons.

Plant is different from other green pod bush varieties, very dwarf, stocky, rarely over 1-foot tall but wide spreading in row with long jointed fruit-spurs and semi-runners trailing on ground. Vigorous, hardy, susceptible to blight, only medium in yield. Stem very thick, round, ridged above, internodes long; branches few, wholly green. Foliage abundant, very dark green, (among the darkest), thick, crumpled, medium to heavy veining; leaf large, rough, wrinkled, $4\frac{1}{2}$ inches x $4\frac{1}{2}$ inches, very wide across leaflets, widest at rounded base, regular taper with sides incurved to short point. Flowers white, turning cream with age.

Pods borne well above foliage, medium dark dull green in color. Quality fair, somewhat tough, stringy and coarse in texture. Size medium to long, broad and fairly plump ($5\frac{1}{2}$ -7 x $\frac{5}{8}$ - $\frac{3}{4}$ x $\frac{1}{8}$ inches) containing 4-7 seeds in a pod. Shape somewhat flattened, ovate in cross-section, straight to slightly curved, straight backed, constricted, not crowded, smooth, filled to the tip and edge, and rounded to blunt on the end. Spur medium long, slender, flexible and recurved. Suture, placental is flat and carpellary, acute.

Seeds medium, 1.3 x .8 x .6 cm, (70-75 per oz.), broad-oval, occasionally somewhat flat; well rounded ends. Hilum small, flat. Color medium brown (buckhorn brown) over the entire surface with a very slight greenish under color suggested, and marked with an obscure narrow, reddish brown eye-ring.

Tom Thumb. Refs. 48. Denaiffe introduced Tom Thumb in 1895, as a sport from Flageolet Mammoth (his Incomparable), it was brought to the United States by Landreth in 1903 and carried two years; but was not listed by others.

Like Triumph in plant; with short pods, $3\frac{1}{2}$ to 4 inches long, fleshy, slightly flattened, with short necks, slightly curved; seeds broader, shorter, and more oblong than those of Triumph, light green. Denaiffe says hardiness and disease resistance claimed for variety, but not evident to him; while pods are not well held, being liable to become soil stained, and are too short and too flat to be attractive; not very productive.

Triumph of the Frames. Refs. 47, 48, 49, 51, 91. Syn. Triumph. This is a variety which belongs to a race of beans very popular in France and grown not so much for edible pods as for green shell beans or dry green colored beans. Triumph was originated by Vilmorin and introduced by him in 1892 as Triomphe des Chassis. Thorburn in 1894 was the first in this country to list the variety describing it as "a dwarf green seeded variety which by its extreme earliness and small size is the best of all for growing in frames." In 1931 it was found in the catalogs of only four out of 125 leading seedsmen. Twenty-five years ago it appeared more frequently but since our markets are supplied with beans from southern gardens the forcing varieties are no longer grown. This is a productive sort for good quality snap beans when picked very small, but its chief value is when used for green shell beans of fine flavor and green color. Midseason to late, 52 days or from 5 to 7 days later than the earliest sorts. It is quite similar to Wonder of Frame but with finer foliage and with shorter, slender pods and seeds which are somewhat longer, slenderer, and flatter.

Plant very small, 8 to 12 inches high with spread of 1-foot very erect, compact, runnerless; vigor fair to good, hardy, productive of moderate bearing period. Stem stout, short, round, ridged above; branches many, with some secondaries, green throughout. Foliage abundant, somewhat dense, dark green, glossy, rough surface, very crumpled, medium to heavy veined, slight pubescence, thick; leaflets medium to large, $4\frac{1}{4}$ inches long by $2\frac{3}{4}$ inches wide, widest at middle, irregularly square or trapezoidal in outline, distinctly pointed with long tip. Flowers white, cream with age.

Pods borne intermediate among the foliage; dark glossy green in color. Quality poor, except when very small, stringy, tough, quite fibrous, but fine in texture. Size medium short, rather narrow, and slender ($4\frac{1}{4}$ -5 x $\frac{3}{8}$ - $\frac{7}{16}$ inches), containing 4-5 seeds per pod. Shape flat, oval in cross-section, moderately and uniformly curved, straight backed, regular, not crowded, smooth, filled to the tip and edge and tapering at the end. Spur moderately long, slender and recurved. Suture, placental is flattened to slightly rounded and carpellary, moderately obtuse.

Seeds small, 1.25 x .6 x .4 cm, (165-170 per oz.), reniform, rather flattened; ends rounded and occasionally somewhat truncate. Hilum medium, flattened to slightly protuberant. Color very light green (water green) over entire surface, marked with a darker, vein-like under pattern.

Unique. Refs. 47, 93, 94. Seedsmen in France still list this very old variety; but apparently it is known in the United States only through Irish's trials and descriptions. It is said not to be entirely fiberless, but originally it showed parchment late in the snap-bean stage.

Plant $1\frac{1}{4}$ to $1\frac{1}{2}$ feet tall, much branched, with some runners, holding pods rather poorly so that they are often soil-stained. Foliage deep green, blistered, thick, with quite large, almost round leaflets. Flowers white. Pods 4 to 6 inches long, $\frac{1}{2}$ inch wide, flattened, considerably curved, green. Seeds 5-6, $\frac{1}{2}$ inch or more long, more than half as broad, plump, oblong or slightly kidney-shaped, with rounded, rarely truncate, ends. White.

Ventre de Biche. This is an old French variety that has long since passed from cultivation. It has been grown in America only in tests at this Station in 1883.

Plant dwarf, vigorous, forming large bushes, with pods sometimes borne above the abundant, grayish green, slightly rough-



TRIUMPH OF THE FRAMES

Natural size



SUNRISE

Natural size.

ened foliage. Pods long, straight, almost cylindrical, stringy, and fibrous. Seeds large, about 90 to the ounce, $\frac{3}{4}$ inch or more long, less than half as wide, oblong rather than kidney-shaped, clear buff, light dun with veiny markings, or yellowish brown with dark yellowish ring about the eye.

Victoria. Refs. 13, 53. Burr described this as one of the earliest varieties, with edible pods in 7 weeks; but it was probably grown mainly for green shell beans, since the pods were tough and stringy.

Plants $1\frac{1}{6}$ to $1\frac{1}{8}$ feet. Branches few. Flowers purple. Pods $4\frac{1}{2}$ to 5 inches long, green streaked and spotted purple, tough and parchment like when ripe. Seeds 5 or 6, about $\frac{5}{8}$ inch long, not quite half as wide, oblong, slightly flattened, compressed at ends, flesh-colored, striped and spotted purplish, darkening to dull reddish brown and chocolate brown.

Vienna. Refs. 48, 91. This is a variety of European origin brought to the United States by Thorburn in 1900. It was vigorous, hardy, very early, and moderately productive, but the pods, as commonly used in America, are tough, coarse-textured, and very stringy. In Europe, where the pods are used when quite small it was classed as a standard forcing bean.

Rather tall dwarf, vigorous, somewhat straggly in growth. Foliage slightly crumpled, rough, medium green. Flowers white. Pods 5 to $5\frac{3}{4}$ inches long, narrow ovate in cross-section, slightly curved, with long tip, green. Seeds like Long Yellow Six Weeks in shape, and size, or possibly a trifle broader, and colored like Old-fashioned Yellow Eye.

Warren. Refs. 41, 48, 49, 59, 80, 88, 91. This was a shell bean of some merit that originated with David Warren, Essex County, Mass. It was grown locally for some years and introduced commercially about 1882 by Gregory and others. Its use and value are the same as those of Low's Champion to which it is very similar.

In our tests, plants and pods were indistinguishable from those of Low's Champion. Seeds were slightly smaller, slightly ovate, rounded at ends, very seldom truncate, darker in color, black with violet tint.

Warwick. Refs. 27, 29, 47, 48, 51, 53, 59, 81, 85, 91. Henderson brought this variety from England to America about 1890 and it was quite highly commended both in England, where it was called an Improved Early Fullmer, and in America. It was listed by several seedsmen and carried for at least fifteen years. At the time of its introduction and for some years later, it was considered the earliest snap bean, and the second earliest green-shell bean; for which use, however, the seeds were rather small.

Differed from Red Valentine only in plants having rather more rigid stems, pink rather than white flowers, flat rather than rounded pods, more stringy and of poorer quality. Seeds decidedly shorter and more plump, ovoid, with greater area of surface covered with the reddish purple color.

White Advancer. Refs. 51, 53. This English variety was apparently introduced by Carter about 1873, when it received a First Class Certificate from the Royal Horticultural Society. It reached the United States very promptly, being distributed in 1874 by Crosman Bros., Rochester, N. Y.; but was never widely grown.

Much like White Flageolet; but the seeds were longer, almost

cylindrical, and shaded yellowish cream about the eye. The flat straight pods were edible in early stages only.

White Lyonnaise. Refs. 47. This is one of the very few representatives of Martens carinate or "keeled" beans, the seeds of which are marked by a distinct ridge or keel where the dorsal edges of the cotyledons meet. This white-seeded strain was introduced by Vilmorin in 1895. It is a midseason variety, useful both as a snap pod or green-shell bean.

Plant rather tall dwarf bean, $1\frac{1}{4}$ to $1\frac{1}{2}$ feet or more, very vigorous, much branched. Foliage abundant, light green, thick, rough, with large leaflets, almost as broad as long. Flowers bluish pink. Pods 4-5 inches long, much curved, slender, almost round, with long-pointed ends and rather long curved tip, green, fiberless. Seeds 5-9, $\frac{1}{2}$ inch long or more, nearly half as broad, plump, oblong with well-rounded ends, carinate as above. Yellowish white or very light brown.

White Model. Refs. 65. This was one of the varieties introduced by Carter in 1918, simultaneously in England and America, as the result of a cross between Sunrise and Improved Longsword. As grown here, it was very early and very productive of long pods with fair quality as snaps; but the seeds were rather small for green-shell beans.

Plants about like those of White Kidney, possibly a little shorter, but branching higher with some secondary branches, and with rather smaller, slenderer leaflets. Pods longer, narrower, rounder in cross-section, fleshier, and with but little string. Seeds 5-6, smaller, distinctly more flattened and more glossy white than those of White Kidney, otherwise very similar.

Willmot. Refs. 47, 56. The only American record appears to be that of the test at the Missouri Botanical Garden, when the variety was at least a half-century old. It was an old English forcing bean, known also in Germany but apparently not in France. McIntosh says it was an excellent forcing variety, quite similar to Fullmer's Early, but distinct; productive.

Plant under 1-foot, but with some runners; leaflets small, nearly as broad as long, deep green, thin, papery. Blossoms purplish. Pods 3 to 5 inches long, half an inch wide or less, slightly curved, with short stout spur, green, crisp and tender while young. Seeds very small, less than one-half inch long, more than half as broad, thick, compressed at the ends, usually truncate, yellowish, brown with dark eye-ring.

Wonder. This variety received an award of Merit from the Royal Horticultural Society in 1924, this was the year previous to its introduction to America by Watkins & Simpson. It is evidently a descendant, by selection or crossing, of Feltham Prolific; but with pods as long as those of Satisfaction. Unfortunately the quality of the pods was not as much improved as their appearance, although they are produced early and abundantly. This is quite distinct from Wonder Forcing tho both are listed under the name Wonder.

Pods slender, round and plump, straight rather dull light green; and with 6 seeds, largest of the series, about 70 to the ounce, with brown areas larger, with brown spots quite numerous in small white areas, and with the dark eye-ring of Satisfaction often separated from the brown by narrow white lines.

Wonder Forcing. This variety is of rather uncertain identity but is apparently Veitch's Early Wonder. It is said to be a seedling of Smythe's Hybrid, differing in pods and seed color. Seeds of Smythe's

Hybrid are black or brownish black; while those of Wonder are deep, dull black. Wonder was grown here from seeds sent on our order for that variety, but labelled Green Podded Forcing. It was very early and fairly productive; the pods were rather tough, stringy, but only moderately fibrous. This is quite distinct from the Wonder of Watkins & Simpson.

Plant about 1-foot tall, erect, stems rather slender, branching, few, without secondaries. Foliage moderately abundant, rather light green, not glossy nor rough, thin. Leaflets of medium size, broadest one-third from base, quite sharply pointed. Flowers pink. Pods borne singly, 5 inches or more in length, less than one-half inch broad, very broad oval to almost round in cross-section, slightly curved, not constricted, with pointed ends and long, fairly heavy, rigid, curved tips, light green, silvered. Seeds 5 or 6, occasionally reaching one-half inch in length, broad oval or slightly kidney-shaped, not plump, ends short-rounded, rarely truncate, equal in width, deep black, dull to almost polished.

Wonder of France. Wonder of France originated with Bonnemain, who introduced it to French growers in 1884. It reached America the next year; and was grown here in recent tests. It is in the same class with Triumph of the Frames, and by some, considered synonymous. Both varieties are still offered in American catalogs.

Plant dwarf, about $1\frac{1}{6}$ feet, erect but spreading, much branched, not viny, vigorous. Foliage medium in amount, dark green. Leaflets medium to large, widest at middle, irregularly square or trapezoidal in outline, distinctly pointed; flowers white or cream, rather large. Pods $4\frac{1}{4}$ to $4\frac{3}{4}$ inches long, sometimes 5 or more, about $\frac{3}{8}$ inch wide, half as thick, ovate in cross-section, considerably too much curved, very regular and smooth, with rounded ends and long, rigid, moderately heavy tip, dark, dull green, decidedly stringy, fibrous, of rather fine texture but poor quality. Seeds 6, kidney-shaped, more flattened than those of Chevrier, less than those of Triumph; nearly $\frac{1}{2}$ inch long, about 160 to the ounce.

WAX PODS

Alexander Black Wax. Refs. 45. This was grown at Geneva in 1889, with seed received from Alexander. The plants were the tallest and had the earliest pods of several black seeded wax beans grown that season; but it was also the least productive, which probably accounts for its early disappearance in trade lists.

Plant $1\frac{1}{4}$ feet tall. Foliage light green. Flowers pale pink. Pods usually single, 4 to $4\frac{1}{2}$ inches long, curved at apex, yellowish white and somewhat wrinkled when ready as string beans. Seeds black.

Allan Imperial Wax. Refs. 41, 48, 91. Syns. Imperial Golden Wax, Salzer's Earliest Wax. This variety was originated by Allan and introduced by him in 1890 and by Vaughan in 1901. A few years later it was listed by about a dozen seedsmen, but never became very popular and was soon dropped. In season it was a second early, moderately productive, with flat, long, large, and straight pods.

Plant rather more than a foot tall, erect, heavy-stemmed, runnerless; leaflets large, broad, medium green in color, rough and slightly crumpled. Flowers white. Pods longest of flat-podded wax beans, slightly curved, very broad, flat, with rounded ends and long, straight, heavy tips, tough, stringy, fibrous, coarse-textured, and of poor quality, very late in yellowing, frequently green-shaded, occasionally solid light green. Seeds 5-6, 55 to the ounce, $\frac{3}{8}$ inch long, more than half as wide, very broad-oval or oblong, tending to kidney-shaped, quite plump, but not round

in cross-section; white, with markings similar to, but larger than those of Detroit Wax.

Amber Wax. The only record of Amber Wax is from the 1890 catalog of Delano Bros., Lee Park, Nebraska. The description indicates a fine, showy variety, plant bushy, with stiff stalks, bearing long, round pods containing 7 to 9 beans, amber colored when ripe. The seed of Dwarf Butter is of the same light brown color.

Asgrow Wax White Seeded. Syn. Keeney's White Seeded Refugee Wax. As first introduced previous to 1927 this bean was known as Keeney's White-seeded Refugee Wax, but the name as given above is now used by the Associated Seed Growers, the organization with which N. B. Keeney & Sons became affiliated in 1927. Asgrow Wax is the result of a cross between the old-fashioned, dark-seeded Refugee Wax and White Marrowfat, the well-known field bean. As grown in our trials at Geneva in 1930, we were unable to link this variety with any other group of wax pods. Evidently certain plant characters from the White Marrowfat have made this variety quite individual when compared to other Wax Beans. The foliage and growth habit differ especially from other sorts. This variety is of too recent introduction to determine its true usefulness. It has high quality and is suggested for use as a cut bean for canning. The value of white-seeded varieties for canning is great because the dark-seeded parts show color as soon as the pods begin to assume a round-podded shape. The pods were ready to pick in about 53 days, or 2 to 3 days later than the Refugee Wax and Pencil Pod groups.

Plant small, 10 to 12 inches tall with equal spread, very erect and compact, runnerless; vigor fair, moderate in yield and bearing period. Stem short, thick, rigid; branches rather many for size of plant, green thruout. Foliage medium abundant but very compact and dense, dark green leaves with smooth surface, fine veining, very slight pubescence, thin; leaflets long, rather narrow, generally curled with the terminal leaflet reversed. Flowers white.

Pods borne mostly below the foliage; light yellow in color. Quality good to excellent; very fleshy, brittle, fiberless, tender, stringless until late in edible stage and fine in texture. Size short to medium, quite broad and plump ($3\frac{1}{2}$ - $4\frac{1}{2}$ x $\frac{1}{2}$ - $\frac{5}{8}$ x $\frac{1}{2}$ - $\frac{5}{8}$ inches), containing 5-6 seeds per pod. Shape round, nearly circular thru cross-section, curved, especially so near spur end, hump-backed, slightly constricted, not crowded, smooth, filled to the tip and the edge, and rounded at the end. Spur short, moderately stout and straight. Suture, placental is rounded, likewise the carpellary.

Seeds small, $1.15 \times .7 \times .6$ cm. containing 95-100 per oz. Shape short oval, broad oval thru cross-section, end abruptly rounded, occasionally blunt and nearly truncate, dorsal surface sometimes inclined to be rather wedge-like. Hilum very small, and slightly protuberant. Color dull white, marked with a vein-like net work over the entire surface and with a slight yellowish tinged, indistinct eye-ring.

Bismarck Wax. Refs. 27, 41, 48, 49, 59, 61, 63, 91. Buist brought Bismarck from Germany in 1889, and introduced it the following year. On the Berlin markets, where Mr. Buist saw it in 1887, it was said to be a favorite sort, apparently much like Currie Wax in earliness, hardness, and productivity, but with curved, round pods, slightly better in quality, but not really

suitable for home use because of stringiness. The seeds were smaller and proportionately shorter than those of Currie Wax, ovoid rather than oblong, "solid black." The variety never became popular in America.

Black-Eyed Wax. Refs. 9, 15, 16, 27, 28, 29, 48, 49, 61, 63, 91, 96. A variety of American origin said to have resulted from a cross between Black Wax and Golden Wax, and introduced in 1887 by both Henderson and Burpee. For a time it was quite popular, being listed by 30 seedsmen in 1901, but in 1907 it was reported by Tracy as almost out of cultivation. Now it is almost unknown. Grown at Geneva in 1894, it was found to be early, of quite long season, and quite productive.

Plant large to medium, about $1\frac{1}{8}$ feet tall, erect, stiff-stemmed, runnerless; foliage medium in size and color. Flowers white. Pods $4\frac{3}{4}$ to $5\frac{1}{2}$ inches long, somewhat curved, oval in cross-section (Tracy) (thicker than wide, Denaiffe), deep yellow, very fleshy, brittle, stringless, fiberless, of good quality. Seeds 5 or 6, rather more than $\frac{1}{2}$ inch long, or broad, very plump, kidney shaped, white with large semi-solid or somewhat "butterfly" shaped black splotch about the eye, apparently much like Kidney Wax.

Boston Dwarf. Refs. 97, 98. Gregory first listed this bean in 1883, the next year after it had been grown in the trials at Geneva. No information as to its origin has been discovered nor does the color of its seed give any clue when noted in comparison with color of seed of present-day wax beans. Gregory in his description claims it to be superior to German Black Wax in vigor and productivity. Wing's notes speak of two types, differing somewhat in height of plants, color and size of foliage, and color, amount of curvature, and relative slenderness of pods, but he describes and gives data for only one.

Plants bushy, not much branched, runnerless, stems often shaded red; foliage somewhat scanty, medium green; leaflets of medium size, taper-pointed. Flowers blush pink. Pods 3 to 4 inches long, straight or slightly curved, with short, stout tips about $\frac{1}{2}$ inch wide, ovate in cross-section, fleshy when ready for use, shrinking much in ripening becoming much contracted between seeds, stringless and of good quality, yellow. Seeds 3 or 4, not quite $\frac{1}{2}$ inch long, half as wide and as thick as wide, slightly kidney-shaped, varying in color from dark dun to dark brown.

Brittle Wax. Refs. 41, 48, 69, 77, 91, 99. Syns. Round Pod Kidney Wax, New Round Pod Kidney, Kidney Wax Round Pod. Confusion exists between varieties of black-eyed or very dark brown-eyed wax beans. In the growers' lists of today 12 different names occur. Close inspection of the seeds and of the growing plants and pod characters would indicate only two varieties with perhaps strains which differ but slightly. Of these similar varieties, Round Pod Kidney Wax was probably the earliest in origin, having been introduced in 1900 by Johnson and Stokes. Brittle Wax was introduced as Twentieth Century Dwarf Wax the year following, the name being changed to Brittle Wax in 1902 as the result of a prize name contest. Four years later, in 1906, Burpee introduced the Burpee Kidney Wax and Maule the same year his Improved Butter Wax. The first three of these originated with Keeney and the last with Rogers Bros. Thirty years after the

type was introduced it is exceedingly difficult to separate the varieties and impossible to assign the synonyms of each with certainty. Many types and strains have been grown here in our recent tests and compared as carefully as the decidedly variant material admits. Not only do the brown-eyed seeds become black-eyed with age, but these colors and shades are sometimes actually reversed from parent to progeny or when grown under a different environment. (Ref. *Owens Journ. Agr. Res.* 37:435. 1928.) The four names given above and eight others using a different arrangement of the same words are commonly found in the trade lists. While very minor differences may occur, it is significant that nearly all handlers of bean seeds, whether growers or retailers, list only 2 of the 12 names. Brittle Wax and Round Pod Kidney Wax being very nearly identical, we have chosen the name Brittle Wax to represent the group which has seeds that show the brown coloring the more often and the name Kidney Wax to represent the other form of the dark brown black-eyed wax sorts, this latter group showing the smaller amount of eye marking.

Brittle Wax came from a cross between Black-eyed Wax and Round-pod Refugee. It is, therefore, a half-brother of Round-pod Kidney Wax and Pencil Pod Black Wax through the Round-pod Refugee parentage. Brittle Wax in quality is one of the very best of the wax pods, although it is not superior to Pencil Pod Black Wax in this respect. It is a variety suitable for all uses, home garden, market, and canning. It is widely grown as a canning bean because of the long, fiberless pods, only slightly curved at the tip, and with exceedingly good color. The seed develops slowly and shows very little pigment. It is used both as a cut bean and for canning whole. Brittle Wax grows best on sandy loam soils and yields its best only under very favorable conditions. In season, a second early, 50 days at Geneva, this is only 4 days later than Challenge Black Wax, 2 to 3 days later than Wardwell's, the same in season with Pencil Pod, Delicious Wax, and Golden Wax, and possibly 2 days earlier than Stringless Refugee Wax. As originally offered, Brittle Wax differed slightly from Round Pod Kidney Wax, but most seedsmen catalog them as similar. Keeney considered Brittle Wax the finer but more delicate of the two. As grown here, plants of Brittle Wax were about 2 inches taller and more erect in early stages, but similarly spreading later, pods more curved, more slender when viewed sidewise, and slightly more constricted. Except for the seed and flower color, Brittle Wax is very similar to Pencil Pod Black Wax, the plants are not as large, vigorous, or productive, and the foliage is lighter in color and the pods slightly smaller.

Plant large, 14 to 16 inches tall, spread in row about 15 inches, erect early, somewhat drooping as pods enlarge, more spreading in habit when fully grown; vigorous, only moderately productive over long bearing period. Stems rather slender, smooth, short internodes, base short; only moderately branched, rarely with secondary branches, but without runners, green thruout. Foliage abundant, medium green; leaf surface almost glossy, rough, occasionally slightly crumpled, medium thick; leaflets large, $4\frac{3}{4}$ to

5¼ inches long by 3¼ to 3½ inches wide, somewhat below center, rather rounding with abruptly taperpointed tips, laterals often quite irregular. Flowers white.

Pods borne intermediate among the foliage; light whitish yellow in color. Quality excellent; brittle, stringless, fleshy, fiberless, and fine in texture. Size long, rather broad and quite plump (5½-6¾ x ¾-1 x ¾-1 inches), containing 5-7 seeds per pod. Shape round, broad cordate to nearly circular in cross-section, moderately to much curved, creasebacked, slightly constricted, crowded, smooth, filled to the tip and edge and rounded at the end. Spurs long, slender and curved to sharply hooked. Suture, placental is indented and carpellary, rounded to obtuse.

Seeds medium, 1.45 x .7 x .6 cm. (80-90 per oz.); slender to medium reniform, plump; ends rounded. Hilum small, flattened. Color chalky white, marked with grayish vein-like under pattern and with a very dark brown, later turning to black, pattern in the form of a broken eye-ring quite variable as to shape, but always on the hilar surface and occasionally as a strip over one or both ends.

Burpee White Wax. Refs. 10, 15, 45, 48, 59, 64, 67, 68, 91. The exact parentage of the Burpee White Wax is unknown, but it probably came as a simple selection from the old variety White Wax. The new strain was introduced by Burpee in 1905 and came from Keeney who had made the selection some years previous. Only four seedsmen listed it in 1931, indicating its limited use. The pods are ready to use in about 50 days, the same as for Golden Wax. Burpee White Wax differs from Michigan White Wax in having taller, more compact plants, larger leaflets, wider and flatter pods, with more pointed ends and longer tips. As first introduced, it was superior to Davis Wax or Wardwell's Kidney Wax, and quite similar to Keeney Rustless and the older forms of White Wax.

Plant 14 to 16 inches tall with spread of 15 inches; erect, very compact, bushy appearance, runnerless; good vigor, moderately productive over long bearing season. Stem stout, round, smooth, ridged above; branches few, rather rigid yet sometimes drooping as pods reach green shell stage, green thruout. Foliage abundant, medium green, dull, fairly smooth, slightly crumpled; leaflets 4½ inches long and 3¾ inches wide, broad for length, widest nearest base, sides taper gradually to short, full point, slightly curved at tip. Flowers white.

Pods borne mostly below the foliage, light to medium yellow in color. Quality good; stringless, nearly fiberless, quite fleshy, brittle and fine in texture. Size, short, broad, and slender (4½-4¾ x ¾-1 x ¾-1 inches), containing 4-5 seeds per pod. Shape flat, ovate in cross-section, straight to slightly curved, straight to slightly creasebacked, somewhat constricted along placental surface as well as on the sides, not crowded, smooth, filled to the tip and edge and rounded on the end. Spur short, moderately stout and curved. Suture, placental is flattened to slightly indented and carpellary, moderately acute.

Seeds medium, 1.25 x .75 x .6 cm. (80-86 per oz.), quite uneven, oblong, slightly reniform, quite plump, oval to moderately broad oval in cross-section; ends uniformly rounded. Hilum small and moderately protuberant. Color chalky white over the entire surface; marked with a rather indistinct vein-like under pattern.

Challenge Black Wax. Refs. 36, 47, 48, 49, 59, 67, 68, 85, 91, 97, 98. Syns. Challenge Dwarf Black Wax, Challenge, Challenge German Black Wax. Although plainly of German Black Wax type, this variety must be classed as a distinct variety in plant, foliage, pod, and seasonal differences. It is said to have originated with Rogers Brothers, of Chaumont, N. Y., from a single plant found in a bean field grown from German seed. D. M. Ferry introduced the variety in

1891 as Challenge Dwarf Black Wax Extra Early. It was exceedingly popular for a time, being listed by about 60 seedsmen in 1901, but since then it has been gradually superseded by other varieties, appearing in less than 20 catalogs in 1921. As an early round pod wax it is a useful home garden sort. The earliest of our garden beans, 46 days to the first pods, 4 to 6 days earlier than Pencil Pod or Sure Crop. The plants and pods of Challenge, while resembling German Black Wax in many ways, are much smaller in all respects.

Plant very small, ¾ to 1 inch tall with spread of ¾ inch; stocky, erect, compact, while plant can be said to be stocky its small size shows low vigor and weakness; entirely without runners; vigor fair, unproductive, short bearing season. Stem stout, round, smooth, ridged above; branches few, purplish at nodes and on flower stalks. Foliage medium in amount, medium green, leaf surface slightly rough or crumpled, rather glossy; leaflets about as broad as long, 3½ inches long x 3 inches wide, widest near base of leaf, triangular, straight sided, rather long, acute tip. Flowers rose purple.

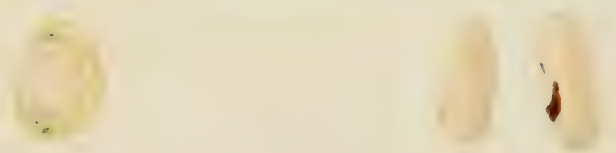
Pods borne very largely below the foliage; medium dull yellow in color. Quality good; stringless, quite fleshy, brittle and fine in texture. Size moderately short, narrow and very plump (3½-4 x ¾-1 x ¾-1 inches), containing 4-5 seeds per pod. Shape round, nearly circular in cross-section, much curved, occasionally twisted sideways, straight backed, regular, fairly well crowded, smooth, filled to the tip and the edge and tapering at the end. Spur moderately long, fairly stout and decidedly recurved. Suture, placental is somewhat rounded and carpellary, broadly obtuse.

Seeds small to medium, 1.5 x .75 x .6 cm., containing 95-100 per oz. Shape somewhat cylindrical, occasionally sub-reniform, quite plump, broad oval thru cross-section; ends abruptly rounded and occasionally truncate. Hilum small and flat with a tendency for a portion of the placental tissue to adhere occasionally. Color jet, medium dull black over the entire surface.

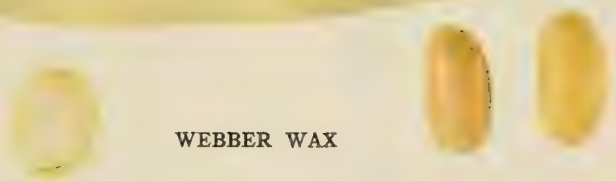
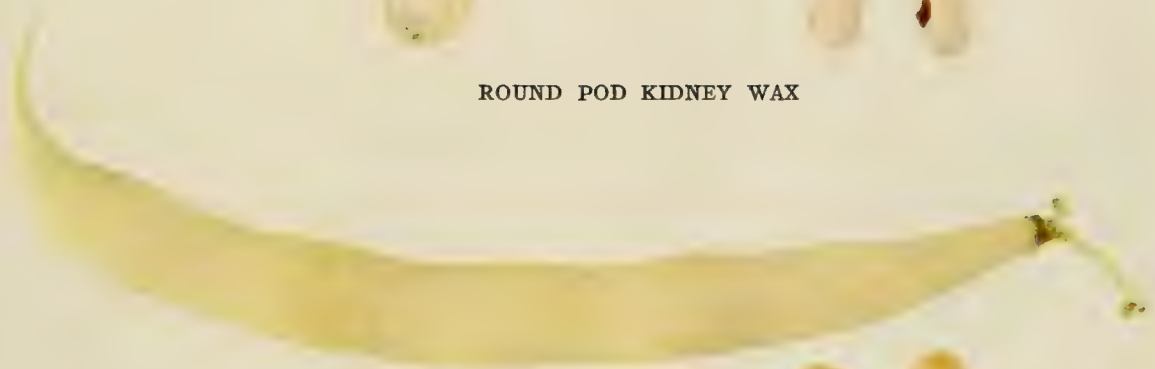
Cracker Jack Wax. Refs. 77. Syns. Clifford Wonder, Admiral Wax, Clifford New Early Wonder Wax, Vanguard, Webber Wax. The year 1913 saw the introduction of a new bean under several different listings, the exact origin or parentage being unknown. Cracker Jack was listed by Leonard Seed Company as a new bean of distinct character having been in the hands of a few Chicago gardeners before its reselection and perfection by the seed company. In 1913 the name Webber Wax also appeared, having been listed by Forbes of Plymouth, Indiana, and Breck of Boston. The same year Simon of Philadelphia carried Cracker Jack and likewise Tait of Norfolk advertised a variety called Vanguard or Cracker Jack. Beans grown under these three names and also as Clifford Wonder greatly resemble each other. As a type it appears more like a yellow-podded strain of Bountiful, deserving the name yellow-podded or Golden Podded Bountiful more than the black-seeded variety that now bears these names. In season it is an early variety. The pods are ready to pick in from 47 to 49 days, making it only a few days behind the very earliest sorts, the same in season with Wardwell's, Sure Crop and Kidney Wax, or 2 days earlier than Pencil Pod and Davis Wax. The pods are not quite so flat, but are rounder, and more meaty than pods of Wardwell's. Because of its drought-resistant qualities, it is more popular with midwestern than with eastern growers.



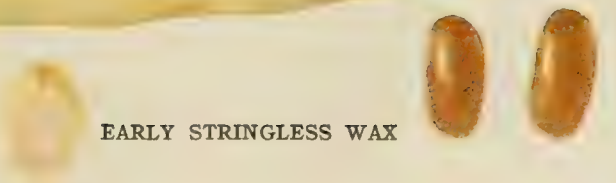
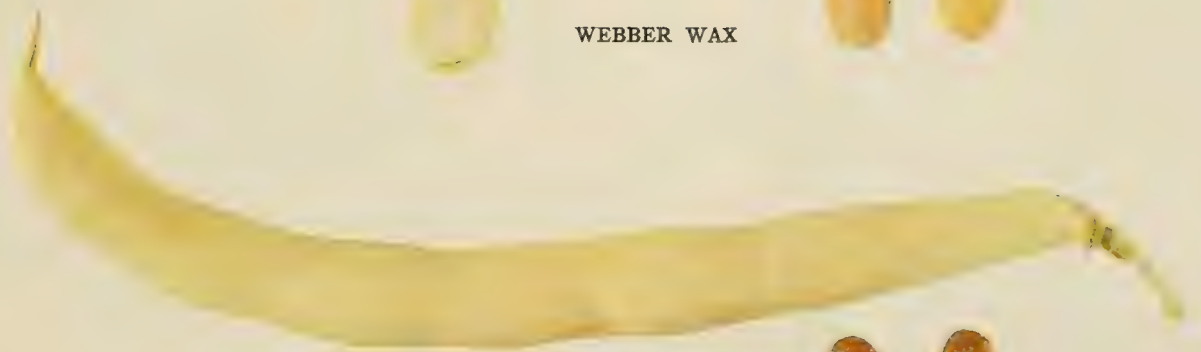
STRINGLESS KING OF THE WAX



ROUND POD KIDNEY WAX



WEBBER WAX



EARLY STRINGLESS WAX



PERPETUAL OR EVERBEARING WAX

Natural size.

Plant small to medium, 12 to 15 inches high with spread of 10 to 14 inches; erect, compact, runnerless; vigor good, quite productive over moderate bearing period. Stem stout, round, smooth, ridged slightly above; branches decidedly few, from near base or at midstem, both stem and branches showing purplish shading at and near nodes. Foliage abundant, rather dull medium to dark green, purplish shaded later becoming distinctly brownish, rough medium thickness; leaflets of medium size, $4\frac{1}{2}$ by 3 inches, widest near base, distinctly rounded, ending in moderately long, somewhat tapering tip. Flowers white or cream at opening.

Pods borne very largely below the foliage; light waxy yellow in color. Quality fair to good; quite brittle, nearly stringless, almost fiberless but somewhat coarse in texture. Size long, fairly broad and slender ($5-6 \times \frac{1}{2} \times \frac{5}{16}$ inches), containing 5 seeds per pod. Shape flat, ovate in cross-section, slightly curved, moderately straight-backed, fairly regular, not crowded, smooth, filled to the tip and edge and long rounded to pointed on the end. Spur long, slender, and moderately curved. Suture, placental is rounded to flat and carpellary, acute.

Seeds medium to large, $1.45 \times .7 \times .55$ cm. containing 65-75 per oz. Shape long oval to sub-reniform, oval thru cross-section; ends uniformly and abruptly rounded. Hilum medium and flat to very slightly protuberant. Color buff (cream-buff to chamois) over the entire surface, occasionally tinged with pure yellow on certain portions but almost never over the entire surface. Marked with a two-toned, moderately broad eye-ring, the outer one being wider and more irregular than the inner and also shaded with a darker brown (saccardo's umber), while the inner portion is much lighter in color (orange cinnamon).

Crystal Wax. Refs. 10, 15, 16, 41, 48, 50, 61, 63, 66, 69, 91, 97, 98, 99. Syns. Cabbage Wax, Crystal White Wax, Ice Bean, Ivory Pod, Silver Wax. A variety long in cultivation under various forms and names. The variety as named above was listed by Sibley in 1883 and by Ferry in 1884, by Gregory in 1882 as Chrystal White Wax, and by Salzer in 1904 as the Silver Bean. Ivory Pod Wax, Ice Bean, and other names have also been used, and when grown in test have exhibited only slight differences from Crystal Wax. No earlier history as to time of introduction or manner of origination has been found. This variety is interesting because of the color of the pods, but has little practical value except to the canner as a bottle pickler when the pods are quite young. In season late, 59 days to first pods, 10 days later than Refugee Wax, or the same as Hodson Wax. The vine is similar in growth habit to Refugee Wax, except for the runnerlike branches. The pods are somewhat the same shape as Refugee Wax, but are shorter and of different color. The seed is similar to seed of Navy Field Bean.

Plant small and slow growing, 10 to 12 inches high; erect but very spreading in habit with many runnerlike branches trailing on ground; vigor fair, long season, moderately productive. Stem rather slender, round tending to angular, internodes very short; branches many. Foliage abundant, medium green, glossy, smooth, medium thickness and veining; leaflets small as Refugee but less slender, $3\frac{3}{4}$ inches long and $2\frac{1}{2}$ inches wide, terminal leaflet widest at $\frac{1}{4}$ distance from base, secondary leaflets widest at base; angle of one side of leaflets with base quite squared, long taper to rather slender point. Flowers white.

Pods borne intermediate among the leaves; whitish or grayish green in color. Quality good; brittle, stringy, very small amount of fiber, and fine texture. Size short, medium broad, and quite plump ($3\frac{1}{4}-4 \times \frac{3}{8} \times \frac{1}{4}$ inches), containing 3-4 seeds per pod. Shape round, broad oval to nearly circular in cross-section, slightly curved, creasebacked, regular, not crowded, smooth, filled to the tip and edge and rounded on the end. Spur short, medium slender, straight

and occasionally slightly curved. Suture, placental is slightly indented and carpellary, obtuse.

Seeds very small, $1 \times .6 \times .5$ cm. (160 per oz.), broad oval, somewhat sub-reniform, fairly plump altho somewhat flat; ends rounded, occasionally truncate. Hilum small, and somewhat protuberant. Color dull white over entire surface.

Currie Wax. Refs. 1, 35, 41, 46, 47, 48, 49, 53, 67, 68, 84, 91. Syns. Admiral Togo, California Black Wax, Celestial Wax, Eldorado, Norfolk Wax, and Pod Spot Proof. This widely known variety is said to be a "sport" of Golden Wax, found in 1885 by Pagenkoff Bros. in a field of that variety near Milwaukee, Wisconsin. After its introduction by Currie Bros. in 1889 it became a very popular variety and was listed by about a hundred seedsmen in 1901, and by nearly 150 in 1921. Many selections have been made to improve this variety and have been given different varietal names, but in general they differ but slightly from the parent. Early in season, from 47 to 49 days to first pods. This variety is equal to Davis Wax or Golden Wax, but Challenge is 2 days earlier and Brittle Wax 5 days later. Currie differs from Davis Wax in color of seed and flower, in smaller plant and leaves, and in pods shorter and less uniform. The pods are longer and thicker than Golden Wax, but shorter and with much more parchment than Sure Crop Wax. The color of seed and flowers is similar to Sure Crop, but the plants of Sure Crop are larger and more open, with leaves larger and lighter in color. Admiral Togo has shorter, rounder, and more curved pods than Currie. Baltimore Stringless yields better, has exceptionally long pods, and is stringless until pods get quite large. Best of All Stringless has darker foliage, pods more curved and rounder, is stringless until almost past edible stage, and has smaller seeds. Celestial Wax (said to be a selection from the California Black Wax strain) is earlier, with shorter, broader pods and smaller seeds. Early Harvest Wax is decidedly early and the pods are slightly larger and of better color. New Stringless Wax is later and has longer, much less stringy pods. Norfolk Wax is very early and productive. Perfection Wax is productive, but turns yellow very slowly. Pod Spot Proof is very much like New Stringless, but not better than Currie in disease-resistance.

Plant strictly dwarf, medium in size, 12 to 14 inches high with spread of about 15 inches. Erect, compact, vigor only moderate, quite susceptible to disease, productive but bearing period short. Stems stout, round, smooth with slight ridging, internodes long; branches few, long, somewhat slender, occasionally spreading but holding pods well, frequently slight purple shading on branches and flower stalks, more noticeable at nodes. Foliage scanty to medium in amount, medium to light green, dull, smooth to slightly rough, very thin; leaflets medium about 4×3 , broadest very near base, rounded, with comparatively short but sharp tips. Flowers phlox purple.

Pods borne intermediate to below the foliage; light waxy yellow in color. Quality poor to medium; fairly brittle, stringy, some fiber, and coarse in texture. Size long, quite broad and plump ($5\frac{1}{2}-6\frac{1}{2} \times \frac{1}{4}-\frac{3}{16} \times \frac{5}{16}$ inches), containing 5-6 seeds per pod. Shape flat, long oval in cross section, straight, straight-backed, regular, not crowded, smooth, filled to the tip and edge and tapering at the end. Spur long, medium stout and nearly straight. Suture, placental is rounded and carpellary, moderately obtuse.

Seeds medium, $1.5 \times .7 \times .6$ cm. (65-75 per oz.); oblong,

sub-reniform, plump; ends round, but occasionally truncate. Hilum small, flat. Color jet black, covered with a rather heavy bloom of bluish-black hue, in contrast to the dull solid black bloom of German Wax.

Date Wax. Refs. 10, 15, 16, 45, 47, 61, 67, 68, 79, 80, 84. A German variety introduced by Gregory as early as 1881, listed by Thorburn in 1886, and grown at Geneva in 1889. It was cultivated in this country until the end of the last century at least, through never as popular as in France, and particularly in Germany, whose seedsmen still list it. It is of the Flageolet Wax or Perfection Wax type, but the seeds are dun colored or yellowish brown, with deep brown eye-ring, large, very broad for their length, almost rectangular in outline, decidedly flattened. Irish says identical with Long Yellow Six Weeks, but with yellow pods. Denaiffe says pods turned yellow very slowly.

Davis Wax. Refs. 28, 36, 41, 47, 48, 49, 77, 91. Syns. Elgin White Wax, Improved Davis White Wax, Prolific Everbearing Wax, Tait's White Wax, Ventura Wonder Wax. This bean originated with Eugene Davis, Grand Rapids, Mich., and was introduced in 1895, by Ferry, Maule, and others, and by Burpee the following year. Rice, in 1931, introduced a new strain purporting to be stringless. Davis Wax, though of rather poor quality for home garden use, nevertheless has been one of the most widely grown sorts. Over 70 listings in leading catalogs were found in 1931. This great demand has been due to earliness and the beauty of the pods which are long, straight, uniform, and of an attractive light yellow color. If the new stringless strain holds up as such this variety should again become a leading sort. It is essentially a market garden variety to be grown for shipment to distant markets. It is early, 48 days at Geneva, a few days later than Challenge Wax, in season with Curries or Sure Crop, and a few days earlier than Refugee Wax or Pencil Pod. Since this is one of our oldest varieties and one that has been a leading sort for nearly 40 years, it is to be expected that the variety would be offered under several names. During the many years of testing all strains have proved to be essentially identical; though Prolific Everbearing Wax gave rather taller plants, with very coarse foliage, darker in color, pods slightly longer, and seeds perhaps a little smaller. Improved Davis White Wax was somewhat earlier, with smaller plants and foliage, and rather smaller, more uniform, plumper pods, but by no means stringless as claimed. Davis Wax, except in color of seed, is most like Currie Wax, the plant is larger, and the branches green throughout, whereas the plants of Currie have a purple tinge at the nodes, and the pods are longer and flatter.

Plant small to medium, 10 to 14 inches high with spread of 12 to 14 inches; stocky, erect, compact, runnerless but with a few flower spikes showing above foliage; vigor fair to good, moderately productive with short bearing period. Stems stout, round, ridged, short internodes; branches few, wholly green. Foliage medium to abundant, medium green, darker in some strains, almost glossy, but rough and somewhat crumpled, medium thickness; leaflets $3\frac{3}{4}$ inches long, $2-2\frac{3}{4}$ inches wide, widest about one-third from base, quite generally rounded to stem, slightly curving with taper to rather short full tip. Flowers white.

Pods borne intermediate; light to medium dull yellow in color. Quality poor; tough, very stringy and fibrous, not very meaty and rather coarse in texture. Size medium to long, broad and medium thin ($5-6 \times \frac{1}{2} \times \frac{5}{16}$ inches), containing 6-7 seeds per pod. Shape flat, ovate in cross-section, straight, straightbacked, regular, rather crowded, smooth, filled to the tip and edge and rounded at the end. Spur long, stiff, thick, straight and quite green in color. Suture, placental is rounded and carpellary, acute.

Seeds medium to large, $1.6 \times .7 \times .6$ cm. (65-75 per oz.), reniform, plump; well rounded ends. Hilum small, protuberant. Color chalky white, thru which shows grayish vein-like markings over entire surface; marked with indistinct, yellowish, narrow eye-ring.

Delicious. There were two varieties with this name, the earlier one having been introduced by Isbell in 1912. It was similar in habit to Brittle Wax with perfectly round, fleshy pods similar to those of Pencil Pod but with pure white seed with yellowish brown eye-ring. In 1917, due to crop failure, the planting stock was lost and the variety discontinued.

The second wax bean to bear the name Delicious was introduced in 1928 by Landreth and is a variety seemingly with considerable merit. It originated as a sport of Burpee's Stringless Green Pod and was selected in 1922 by the Superintendent at their Filer, Idaho, growing station. Careful selection has fixed the type. It was listed by three seedsmen in 1931. Probable use is similar to that of Improved Golden Wax, a home garden variety of good quality. Season, 50 days, in season with Golden Wax, 2 or 3 days later than Currie Wax and Sure Crop. While the plant is noticeable for the small foliage, it is very unlike Refugee in plant characters. The pods are round to oval but much shorter than other round pod sorts, being somewhat between Golden Wax and Currie Wax in length. The seed is similar in shape and color to Burpee Stringless Green Pod.

Plant medium, 14 to 16 inches tall with spread of 14 inches; erect, compact, runnerless; vigor good with yield moderate, bearing period only medium. Stem stout, branches few and green thruout. Foliage medium to abundant, dark green, with surface rough, crumpled, dull, thick; leaflets rather small, widest at midpoint, quite rounded. Flowers lilac.

Pods borne intermediate among the foliage; light, medium dull yellow in color. Quality good; stringless, almost fiberless, brittle and fairly fine in texture. Size medium long, broad, and quite plump ($4\frac{1}{2}-5\frac{1}{2} \times \frac{3}{8}-\frac{1}{4} \times \frac{3}{8}$ inches) containing 4-5 seeds per pod. Shape round, oval in cross-section, straight to somewhat curved, creasebacked, regular to somewhat constricted, not crowded, smooth, filled to the tip and edge and rounded at the end. Spur long, medium thick and slightly curved. Suture, placental is slightly indented and carpellary, obtuse.

Seeds medium, $1.5 \times .8 \times .6$ cm. (67-70 per oz.), oblong oval, plump to somewhat flattened, ends quite uniformly rounded. Hilum small, slightly protuberant. Color dark auburn brown (mars brown to chestnut brown) over the entire surface blending into a darker shade on the hilar surface; marked with a narrow dark brownish black eye-ring.

Detroit Wax. Refs. 14, 16, 41, 47, 48, 49, 67, 68, 84, 85, 91, 96. Ferry introduced Detroit Wax in 1885, probably as a selection from Golden Wax. It was quite popular for a time, having been listed by about 40 seedsmen in 1901.

Plants practically identical with those of Golden Wax, but in our tests distinctly shorter and branching very low; foliage

rather scanty, with small broad leaflets, medium green, dull, rough, thick. Flowers white. Pods 4 to $4\frac{3}{4}$ inches long, nearly $\frac{3}{4}$ inch wide, cross-section ovate with acute ventral edge, straight, only slightly constricted between beans, ends rounded to almost blunt, with short, heavy, rigid curved tip from dorsal edge, not very fleshy, stringy, quite fibrous, coarse-textured, of fair quality only, yellow, which appears rather slowly and often remains with green shade. Seeds 5, 65 to the ounce, about $\frac{7}{16}$ inch long, rarely $\frac{1}{2}$ inch, two-thirds as wide, broad oval or oblong, very plump but not round in cross-section. Color white, mottled irregularly about the hilum and one end with bluish black and maize yellow.

Digoin. Refs. 47. A variety that appears to have been grown in this country only in the tests at the Missouri Botanical Garden; but which was widely grown in France, where it originated and was introduced about 1895, probably as a selection from Barbes. Irish says it was like Hundredfold, but the seeds were larger and lighter in color. It differs from the parent variety, Barbes, mainly in pod color.

Pods thick, fleshy, free from string and fiber until seeds enlarge, of beautiful golden yellow color. Seeds very broad oblong, with abruptly rounded ends, and very thick, in form intermediate between ovoid and thick kidney-shaped, chamois color tinted salmon, with darker eye-ring.

Double Barrel. Refs. 48, 64, 91. Landreth in 1901 was the first to list this variety, but it evidently originated prior to 1892, when a promise was made of sale "after harvest of 1892."

Plant very much like Maule Butter in habit, but dwarfness, denseness of bush and foliage characters are less marked. Pods are smaller, straighter, and less noticeably "double-barreled." Seeds are narrower, thinner, much more sharply rounded at the end and of a uniform brownish ochre color with darker eye-ring.

Dwarf Butter. Refs. 48. A European variety but little grown in America, and now apparently unknown anywhere.

It was noticeable for its very small, compact plants with very dark foliage. Small podded. The seeds were short, broad, thick, and so crowded in the pods that the ends were markedly truncate, giving an almost quadrangular shape to the seeds as viewed from the side. They were light brown in color, with a yellowish tint.

Dwarf Indian Chief. This is a dwarf form of Algiers or Indian Chief pole bean and one of the oldest wax beans; known in the United States since about 1867. Like most of the black-seeded wax pod beans it has been much confused with other varieties but as with the tall form, it is readily separated from most others by its plump ovoid seeds. Grown at Geneva in 1883, it combined earliness, yield, and quality as did almost no other variety of its time.

Plant 1 to $1\frac{1}{3}$ feet tall, slender stemmed but upright, runnerless, moderately vigorous, much branched; foliage medium in amount, varying in color on same plant. Flowers lilac. Pods $4\frac{1}{2}$ – $4\frac{3}{4}$ inches long, slightly curved, rather short tipped, fleshy, thicker than wide, stringless and fiberless, butter yellow, marked purplish before yellowing; seeds 5, rather more than $\frac{1}{2}$ inch long, very broad oval, or ovoid, plump, black.

Dwarf Mont D'Or. Refs. 10, 15, 27, 45, 47, 53, 63, 66, 79, 84, 93, 94, 97, 98. This bean is probably of French origin, a dwarf selection from the pole bean similarly named. It is one of the most widely spread and most popular wax-pod varieties of France, but in other countries the strictly black-seeded sorts like Dwarf

Indian Chief and German Black Wax seem to be preferred. It was probably first grown in this country in tests at this Station in 1882, but was soon introduced commercially coming from Germany rather than from its home country.

Plants about 1 foot tall, erect, runnerless; foliage abundant, light green, rough but not wrinkled, slightly curled, quite thick; leaflets small, $\frac{1}{2}$ to 2 inches long, 1 to 2 inches wide, varying in shape of terminals from slender and sharply taperpointed to almost round with obtuse tips. Flowers pink or purplish. Pods $3\frac{1}{2}$ to $4\frac{1}{2}$ inches long, almost straight or slightly curved, with long rounded or pointed ends and stout, straight tips of medium length, from $\frac{3}{8}$ to $\frac{5}{8}$ inch long, almost round, somewhat swollen by beans but not noticeably constricted, fleshy, stringless, fiberless, tender, of good quality, pale cream to light yellow, sometimes slightly flecked with purple. Seeds 4 or 5, very similar to those of Dwarf Indian Chief but smaller, and with abruptly curved ends on side view, distinctly broad, oval when viewed edgewise, with sharply rounded ends, dark reddish purple or russeted violet, when old almost black but old seeds when soaked in water clearly show the russeted appearance, while those of Indian Chief become clear violet.

Dwarf Sugar Wax. Refs. 47. Apparently known in America only through distribution of seeds by the United States Department of Agriculture, and may be either one of two German varieties.

As described by Denaiffe: Plant $1\frac{1}{6}$ feet tall, with many long runnerlike branches; pods 5 inches long, curved, yellowish, fleshy, stringless; beans small, like small flat marrows; rather late and yield too small to allow recommendation. The other strain is slightly taller, with smaller pods, very slow in yellowing; and with larger, more oval beans.

Early Stringless Wax. A variety which originated with Olds, prior to 1913, when it was first listed by him. It is said to be a cross between Burpee Stringless Green Pod and Valentine Wax. As grown here in recent tests it falls only slightly short in productivity of Old's and Allan's commendations, and seems an excellent market bean of good quality and handsome appearance, although the pods turn yellow slowly and curve somewhat too much in later stages.

Plant tall, $1\frac{1}{6}$ to $1\frac{1}{4}$ feet tall, very erect, with very rigid stems and comparatively few branches. Foliage medium in amount, dark green, slightly glossy, smooth. Leaflets $4\frac{1}{2}$ by $3\frac{1}{4}$ inches, laterals, as large or larger than terminals, broadest slightly below center, rounded, with short, rather abrupt tips. Flowers white, cream or very lightly blushed. Pods $5\frac{1}{4}$ to $5\frac{3}{4}$ inches long, straight or slightly curved, early, decidedly curved later, regular or later somewhat constricted, with rounded ends and long, moderately heavy, flexible tips from dorsal edges, less than $\frac{1}{2}$ inch wide, round oval in cross-section, but markedly cordate because of deep creaseback, brittle, tender, not especially thick-fleshed, stringless, fiberless, almost fine-textured, light waxy yellow appearing slowly. Seeds about 5, about 70 to 75 to the ounce, nearly $\frac{5}{8}$ inch long, half as wide, decidedly flattened, oblong, with abruptly rounded ends, or slightly kidney shaped, yellowish brown in color, perhaps best described as yellow lake or old gold.

Everlasting. Refs. 45. Grown at Geneva in 1889 and found to be an early mid-season dwarf snap bean, short-podded, with long seeds, brown, spotted with dark red.

Extra Early Wax. A variety which originated with Tait, prior to 1912, seems to have been listed only by that firm, and dropped by them in 1924. It was grown here for three seasons and appeared to deserve its title, but was only fairly productive, flat-podded, and stringy.

Plant about same size as Refugee Wax, but with stouter stem and more rigid branches, bearing foliage very similar in shape and size to that of Refugee tho slightly longer and distinctly broader. Pods $4\frac{1}{4}$ to 5 inches long, straight or very slightly curved, round-ended with long, straight, rigid tips, $\frac{1}{2}$ inch broad, quite evenly oval in cross-section, stringy, somewhat fibrous and coarse in texture, of only fair quality, dull light yellow. Seeds 5, about 55 to the ounce, quite variant in shape and color, but in general larger and darker than Hardy Wax, brown mottled with cinnamon, broader and plumper, occasionally as long, but usually shorter.

Fillbasket Wax. Refs. 50, 86. This name has also been applied to a dwarf green pod and a tall wax bean. With three forms bearing a similar name there has been difficulty in establishing the extent of the distribution of Fillbasket Wax. The Michigan Station reports a trial in 1899 and describes the variety as having round, fleshy pods. All of the "Fillbaskets" had their origin in Germany.

Fisher Stringless Golden. A variety developed by F. S. Fisher from bush plants found among those of Powell Giant Pole, and introduced by Vick in 1913. After about 5 years it was dropped as it did not attain popular fancy.

Plant bush type, extraordinarily vigorous, productive and healthy, but late in bearing; pods 6 to $6\frac{1}{2}$ inches long, nearly $\frac{3}{4}$ inch wide, ovate in cross-section, straight, with short necks, rounded ends, with short, heavy, straight tips from dorsal edges, "hooked" at ends; golden yellow, fairly thick-walled, tender, stringless, of fine flavor. Seeds 5, white, large, very broad oval, flattened, fairly plump, of excellent cooking quality when dry.

Flageolet Wax. Refs. 9, 10, 13, 15, 16, 29, 41, 45, 47, 48, 49, 66, 67, 68, 84, 85, 91, 97, 98. Syns. Giant Red Wax, King of Wax, Midsummer Long Pod Wax, Perfection Wax, Red German, Rennie d'Or, Rennie's Stringless Wax, Simmer's Early Giant Wax. This once popular variety reached America about 1875 from Germany. As originally introduced, it was made up of two distinct strains differing in color of seed. The variation in the seed color consisted of different shades of brownish red, crimson red, purplish red, or violet. In this country strains have been separated on the basis of seed color, the dark called Purple Flageolet and the light called Violet, Scarlet, or Crimson Flageolet. There is also one type known as Perfection Wax which is reputed to have originated by crossing Scarlet Flageolet and Purple Flageolet, seed of this cross appearing with more brown coloring. Burpee introduced Perfection Wax in 1887. This later became known as Violet Flageolet and Purple Flageolet Wax. The Landreth Seed Co., in 1887, introduced Landreth's Scarlet Wax, which later became known as Crimson Flageolet Wax, Red Flageolet Wax and Scarlet Flageolet Wax. The credit for originating both of the above introductions is given to A. H. Ansley & Son, Milo Center, N. Y. All of these strains have been mixed and re-separated many times. Thirty years ago it was a rather popular sort, being listed in 1901 by about 120 seedsmen. Their popularity has steadily declined so that in 1921 there were 30 listings and only 1 in 1931. The pods are ready in 51 days, or 5 days later than the earliest wax sorts, similar in season to Pencil Pod and Brittle Wax. The variety closely resembles Davis

Wax with the chief difference being in the color of seed and larger pods. The shape of the pod is somewhat similar to pods of Canadian Wonder.

Plant medium to large, 14 to 17 inches high with spread of 14 inches, erect, tree like, compact; without runners, vigor good, yield moderate, bearing season tends to be rather short. Stem stout, very rigid, round, smooth, ridged above, internodes long, branches strong, stiff, occasionally slight purplish shading near nodes. Foliage abundant, medium green or lighter, dull, rough surfaced, coarse, crumpled, slight pubescence, heavy veined, thick; leaflets above medium in size 4 to $4\frac{1}{2}$ inches long by 3 to $3\frac{1}{2}$ inches wide at one-fourth or one-third the distance from base, midvein of side leaflets divides the area unequally, almost straight to rather short tips. Flowers phlox pink.

Pods borne intermediate among the foliage; deep waxy yellow in color. Quality poor; tough, stringy, fibrous, and rather coarse in texture. Size long, broad and medium slender to plump ($6-7 \times \frac{1}{2} \times \frac{5}{16}$ inches), containing 6-7 seeds per pod. Shape flat, oval in cross-section, slightly curved, straight backed, regular, not crowded, smooth, filled to the tip and edge and pointed at the end. Spur long, slender and nearly straight. Suture, placental is flattened and carpellary, rounded to obtuse.

Seeds large $1.6 \times .8 \times .6$ cm. (55 per oz.); oblong, sub-reniform, fairly plump to somewhat flattened; ends rounded and occasionally somewhat truncate. Hilum small, flattened. Color varying shades of deep bluish black to maroon with a purplish tinge (indian purple).

German Black Wax. Refs. 9, 10, 30, 41, 44, 48, 49, 60, 63, 66, 79, 91, 96, 97, 98. Syns. Earliest of All Wax, Fuller's Black Wax, Fuller's Ringlead Black Wax, Saddle Back Wax. This variety is one of our oldest known dwarf wax beans. Whether it preceded Dwarf Indian Chief is unknown, but it was listed in America somewhat earlier, about 1865. Interlocking synonyms and the advent of improved strains of black wax beans of this type make it impossible to separate the listings of German Black Wax from the many selections and renamed sorts that came along during the next 40 years. It was very popular during the last quarter of the past century, 150 seedsmen listing Black Wax (which was undoubtedly in great part the German variety) and German Black Wax in 1901, but less than one-third as many 20 years later and only 3 in 1931. As with Currie Wax, several rather distinct strains arose. Saddle-back Wax raised by Keeney and introduced about 1889 by Landreth, Burpee and others, had pods thicker than wide, very fleshy, much curved, with longer tips, and large, plump seeds. Seed of German Black Wax was often substituted for Saddle-back and the two were usually considered identical, but apparently pure seed still produces strains easily separable. Fuller Black Wax had rather longer pods, darker yellow, and rather less stringy. Earliest of All Wax was developed in Northern Michigan for earliness and supposedly rust-resistance, neither of which was apparent in recent tests here. While the yield was very good, the pods were not quite as round as those of other types, and were often distinctly purplish, stringless, and of fine quality, with the seeds crowded in the pods and often truncate. Shipper Wax is a long podded Saddle-back Wax, with much taller plants, very long, very thick, much curved pods. At Geneva pods were ready to pick in 50 days, a second early similar in season to Prolific Black Wax and Pencil Pod, 3 to 5 days later than Challenge Black Wax.



VIOLET FLAGEOLET WAX



BURPEE'S BRITTLE WAX



PENCIL POD BLACK WAX



WARDWELL'S KIDNEY WAX





DAVIS WAX



SURE CROP STRINGLESS WAX



EXTRA EARLY WAX



HODSON SILVER WAX

Plant small, 1 foot tall or less, spread of 10 to 12 inches; erect and compact without runners, vigor only fair, moderate in yield and length of bearing period. Stems of medium strength, smooth ridged slightly above, branches rather few, spreading with weight of pods, generally slightly tinged with purple in places on branches and flower stalks. Foliage medium to abundant, medium green, slightly crumpled, thin; leaflets rather long, 5 by $3\frac{1}{2}$ inches, broadest one-third the distance from base, distinctly rounded, then slightly curved to moderately sharp tips. Flowers rose purple.

Pods borne below foliage; medium yellow in color. Quality very good; very brittle, stringless, fiberless and moderately fine in texture. Size medium long, rather narrow and slender ($4\frac{1}{2}$ -5 x $\frac{1}{2}$ x $\frac{3}{8}$ - $\frac{1}{2}$ inches), containing 5-6 seeds per pod. Shape round, nearly circular to very broad oval in cross-section, curved to Scimitar shaped in some strains, straight to creasebacked, regular, filled to the tip and edge, smooth, not crowded and decidedly pointed at the end. Spur moderately long, rather slender and straight. Suture, placental is slightly indented to somewhat flattened and carpellary, rounded to obtuse.

Seeds small to medium, 1.35 x .65 x .6 cm. (75-100 per oz.), quite variable in this respect; somewhat cylindrical, sub-reniform, plump; ends abruptly rounded to truncate. Hilum small and flat, with a tendency for a portion of the placental suture to adhere to it. Color jet black, covered with a rather heavy bloom, but when removed, a glossy shining black is produced.

Golden Age. Syns. Jubilee Wax. There have been few new varieties of merit offered during the last 20 years, but Golden Age, introduced by Henderson in 1922, is a promising sort. As noted under the green-podded variety, Tendergreen, this firm did some hybridization work 20 years ago which resulted in the introduction of three new varieties, viz., the Henderson in 1920, and Tendergreen in 1922, both greenpods, and the wax-podded variety Golden Age in 1922. These three new varieties bear certain resemblances; all are classed as round pods with large vigorous plants, bearing pods which are stringless and of good quality. The seeds of all three are mottled, and moreover those of Henderson (greenpod) are practically identical with those of Golden Age (waxpod). It would appear that the same parents were used to secure these new and excellent sorts. Although this bean is 10 years old, it has not been widely grown, being offered in 1931 by only one seedsman other than the introducer and then under the name Jubilee Wax. The pods are ready in from 51 to 52 days at Geneva, in season with Refugee Wax, Golden Wax, and Pencil Pod. The pods have rather a better color than Refugee Wax, are slender, more like those of Pencil Pod, fully round, very waxy. The seed may be called intermediate between Hardy Wax and Valentine Wax or between Full Measure and Longfellow. The leaflets are of Pencil Pod shape and size, but not as thick, less crumpled, and more pointed.

Plant 14 inches tall and with spread of from 14 to 16 inches in row; erect, compact, runnerless; vigor good, yield above medium. Stem stout, rigid, base short, smooth, ridged above, internodes short, branching low giving squatty appearance but holding branches erect with pods free from ground, green throughout. Foliage abundant, somewhat coarse, slightly darker than medium green, not glossy, rough, very finely crumpled, very thick; leaflets 4 to $4\frac{1}{4}$ inches long, $2\frac{3}{4}$ to $3\frac{1}{4}$ inches wide, somewhat below middle with straight margins, terminals quite square, side leaflets more one sided, rounded to base, short taper-pointed tips. Flowers pink bluish.

Pods borne intermediate among the foliage; deep waxy color. Quality very good; brittle, tender, stringless, fiberless and fine in

texture. Size medium to long, rather narrow and slender ($5\frac{1}{2}$ -6 x $\frac{3}{8}$ x $\frac{1}{2}$ inches), containing 5-6 seeds per pod. Shape round, nearly circular, altho somewhat cordate in cross-section, moderately curved, slightly creasebacked, regular, quite crowded, smooth, filled to the tip and edge and pointed at the end. Spur long, slender and straight, somewhat flexible. Suture, placental is slightly indented and carpellary, obtuse.

Seeds medium to large, 1.6 x .7 x .6 cm. (85-90 per oz.); nearly cylindrical, occasionally sub-reniform, plump; ends rounded. Hilum small, flattened to slightly indented. Color dark buff (vinaceous-cinnamon) under color and almost entirely covered with reddish brown (burnt sienna) mottling.

Golden Beauty. Refs. 48, 49, 91. This variety was introduced about 1890 by Pearce, London, Canada. It was of Golden Wax type, especially in foliage, but entirely distinct, apparently more hardy and productive.

Plant usually under one foot, stiff-stemmed, erect, compact; foliage grayish green, very smooth surfaced; leaflets very wide, flat. Flowers white. Pods quite characteristic, somewhat like Double-barrel, more stocky, but less creasebacked, $4\frac{1}{2}$ to 5 inches long, slightly curved at tip and less curved, reversely, at neck with pointed ends changing gradually to stout tips of medium length, $\frac{1}{2}$ inch in width, oval approaching round in cross-section, constricted between beans, which enlarge early and show plainly, fleshy, brittle, tender, stringless and fiberless, fair to good in quality, seeds 4 to 6, deep yellow, about $\frac{1}{16}$ inch long, nearly three-quarters as wide and half as thick, very broad oval with widely rounded ends, broadly ovate in edgewise view, brownish ochre with very narrow, darker eye-ring.

Golden Butter Wax. Refs. 16, 61. This variety was grown at this Station in 1882 and in 1883 was considered the same as Dwarf Indian Chief, but comparative growth data prove the two quite distinct. It has been impossible to connect the variety with any other Golden Butter beans. The pods are small, averaging about three seeds only. The pale yellow, almost translucent appearance of the pods and the slender, kidney shape of the beans are the most noticeable characteristics. The seeds are black.

Golden Crown. Refs. 41, 48, 91. A variety, now obsolete, which originated with A. N. Jones, LeRoy, N. Y., from a Yosemite Wax x Ivory Pod Wax cross, and introduced by him in 1899. Tracy considered this better than its older half-sister, Jones Stringless, in having straighter and larger pods, somewhat more productive, and more uniform. It was much like German Black Wax, but white-seeded and with straighter, better-filled pods.

Plant of medium size, erect but drooping with weight of pods, thick-stemmed, runnerless, early, moderately productive over season of moderate length, leaflets of medium size, green. Flowers white. Pods $4\frac{1}{2}$ to 5 inches long, quite uniform, somewhat curved; round, yellow, very brittle, stringless, fiberless and of excellent quality. Seeds 6, crowded in pod, rather more than $\frac{1}{2}$ inch long, about $\frac{1}{8}$ inch wide, and nearly as thick, broad-oblong with short-rounded, frequently truncate ends, white with marked yellow eye-ring.

Golden Eyed Wax. Refs. 9, 14, 28, 29, 41, 45, 48, 49, 57, 59, 84, 85, 91, 92, 95. Syn. Sunshine Bush Wax. Credit for originating this variety has been given to W. J. Bartlett, Oshawa, Canada. It was introduced first in New England, Rawson in 1888 and Low in 1899 offering the seed as an improved new wax bean. Details are lacking as to the parentage or variety from which Golden Eye Wax was selected. It is still

grown in some sections but was offered by only three seedsmen in 1931. A second early, ready in 50 days, in season with Golden Wax. It is quite similar to the old variety known as Allan's Imperial Wax, with seed resembling the molasses face type of Yellow Eye field bean. Few wax varieties show as much green in pod color.

Plant about 1 to 1¼ feet tall, with moderately stout, rigid stem and erect branches; runnerless; vigor fair, moderately productive over short bearing period. Foliage abundant, light to medium green, dull, slightly rough, not crumpled, medium to heavy veined, thick; leaflets 4½ inches long by 2¾ inches wide, long and slender, on much twisted pedicels, frequently reversed showing lighter backs, tips long, slender. Flowers white.

Pods borne intermediate among the foliage; light, moderately waxy yellow in color. Quality poor, stringy, fibrous, tough and coarse in texture. Size moderately long, broad and slender (4½–5½ x ½ x ⅜–¼ inches) containing 5 seeds per pod. Shape flat, long ovate thru cross-section, straight to slightly curved, straight backed, regular, moderately crowded, smooth, filled to the tip and the edge and rounded at the end. Spur moderately long, slender and straight. Suture, placental is rounded and carpellary, acute.

Seeds medium large, 1.35 x .75 x .55 cm., containing 75–80 per oz. Shape medium long broad oval, flattened, occasionally fairly plump, elliptical thru cross-section, ends uniformly rounded. Hilum medium large and flat; color dull white, quite distinctly marked with a vein-like net work over 90% of the surface, with irregular, tawny yellow (Mars yellow to Raw Sienna) blotches; spots and occasionally a solid area similar to molasses face Yellow Eye on the hilar surface and the ventral portion of one or both ends. An eye-ring that is narrow and reddish-brown (cameo brown) in color is usually apparent.

Golden Prize. Refs. 90. Except for periodical references in 1886 and 1887, this variety is practically unknown, although it was listed by one seedsman in 1901. Supposedly a sport from Yellow-eye with golden yellow pods.

Golden Wax. Refs. 14, 16, 25, 27, 29, 35, 41, 47, 48, 49, 50, 58, 59, 61, 63, 66, 68, 69, 80, 81, 87, 91, 95, 99. Syns. Cream Wax, Dwarf Golden Wax, Early Golden Wax, Golden Butter, Isbell's New Golden Butter Wax, Pink-eyed Wax, York Dwarf Wax, York State Wax. The name Golden Wax represents a distinct group of wax beans, one of our oldest known cultivated types. Its origin or exact history is not known. In 1871, Gregory introduced York Dwarf Wax, the forerunner of and by some thought to be identical with the bean which Ferry introduced 5 years later as Golden Wax. The bean York Dwarf Wax was thought to have come from Marten's old bean, *Phaseolus sphaericus dimidiatus*. Whether York came directly from Germany, was found in America as brought over by immigrants, or whether the original type was American and went to Europe, is unknown. After the introduction of Golden Wax by Ferry, York Dwarf Wax was soon dropped, but the type which it represented became known as Golden Wax (old style). This form can still be secured, in fact was listed by 17 seedsmen in 1931, although it is 60 years since it was introduced. An Improved Golden Wax has also been introduced as well as a variety known as Rustproof Golden Wax (Grenell). All differ in some degree perhaps more in plant characters than those of the pods. A survey of the catalogs issued in 1921 showed that 70

seedsmen offered Golden Wax, 151 Improved Golden Wax, and 20 Rustproof Golden Wax. About the same ratio is maintained today.

For the most part Golden Wax is used chiefly as a home garden bean, although it is in some demand as a canning bean. Probably the size of the pod is its chief detriment, since the vogue is rather for the long round podded sorts, such as Kidney Wax and Pencil Pod, or for the flat-podded types similar to Sure Crop. Early, 48 to 50 days at Geneva, in season with Pencil Pod, but a few days later than Wardwell's Kidney Wax and Challenge Black Wax.

Plant small, 10 to 14 inches high, 10 to 12 inches spread; erect, compact, stocky, without runners; vigor only fair, moderately productive over short bearing period. Stem very thick, stout, rigid, round, slightly ridged above, internodes short; branches few, no secondaries; wholly green. Foliage medium abundant, medium green in color, dull, rough surface but not crinkled or wrinkled, thick; leaflets about 3½ by 2¾ inches, broadest one-third distance from base, much rounded, sides slightly incurved to rather obtuse tips. Flowers white.

Pods borne largely above foliage; medium light waxy yellow with a slight greenish tinge in color. Quality good, stringless, has some fiber, very brittle, but rather coarse in texture. Size medium long, narrow, and medium thick (5–5½ x ½–⅝ x ⅜ inches) containing 5–6 seeds per pod. Shape oval to flat, ovate in cross-section, straight, straight-backed, regular, not crowded, smooth, filled to the tip and the edge, and rounded at the end. Spur short, thick and straight, altho at times slightly curved. Suture, placental is rounded to very slightly indented and carpellary, acute.

Seeds small to medium 1.2 x .8 x .6 cm. (70–75 per oz.), short oval, nearly circular in cross-section, abruptly rounded ends. Hilum small, rounded to flat. Color dorsal surface and a portion of the ends and sides, white; hilar surface irregularly mottled and patterned with purplish maroon (dull indian purple) to (anthracene purple). In some instances a solid deep buff to brown irregular eye-ring is perceptible.

Golden Wax (old style). Refs. 69. This was first known as York Dwarf Wax. The pods differ from those of Golden Wax by being somewhat marked with purple, broader, heavier, and with shorter tips. The seeds of "Old Style" beans are about one-eighth larger than those of Golden Wax with the darkened area quite uniformly distributed around the eye, without the tendency for marking to extend over the end of the seed nearer the neck of the pod, such as is found in seeds of Golden Wax. The borders of the dark areas are much more irregular in the older type and small spots and patches in the white are much more numerous. Plants of "Old Style" are smaller, averaging perhaps 2 inches shorter than either Golden Wax or Improved Golden Wax.

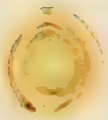
Grenell Rust Proof Wax. Syns. Gold Wax Improved, Green's Golden German Wax, Golden Jersey Wax, Improved Golden Wax, Improved Rustproof Golden Wax, Grenell's Improved Golden Wax, Rustproof Golden Wax. This strain originated with W. H. Grenell of Pierrepont Manor, N. Y., and was introduced in 1884. It was a selection from Golden Wax. Similar to Golden Wax, but perhaps because of the association of the names Improved and Rustproof this strain is more often offered than any other. Seeds rather larger, marked with varying shades of tan and brown with



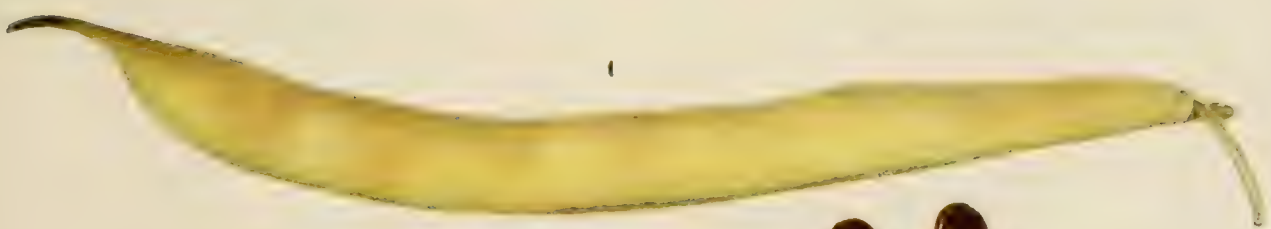
CHALLENGE BLACK WAX



GRENELL'S IMPROVED KIDNEY POD GOLDEN WAX



IMPROVED BLACK WAX



STRINGLESS REFUGEE WAX





EARLIEST MARKET WAX

Natural size

little or no purple. Pods, shorter, flatter, usually perfectly straight with longer tips. The pods are often still quite green when in best edible condition but stronger yellow when past green stage.

Griswold Everbearing. Refs. 80. This bean originated with Thos. Griswold, Wethersfield, Conn., some time before 1890, and was introduced by Johnson and Stokes in 1890. After a brief reign of popularity it soon disappeared from listings.

Plant erect, stiff-stemmed, much branched, vigorous, spreading, very productive, early and continued over a long season; pods 6 to 7 inches long, somewhat curved, round, fleshy, wholly stringless, fine flavored, light waxy yellow; seeds of Mohawk or Full Measure type.

Hardy Wax. Refs. 48, 91. This wax bean, a seemingly good and useful variety, originated with Keeney and was introduced by Livingston in 1906. Inasmuch as the color of the seed coat is unlike that of any other garden bean in cultivation today, it is quite probable that Hardy Wax is of hybrid origin and not a selection from any other sort. Its popularity has perhaps been influenced by the similarity of its pods to those of Pencil Pod. They are somewhat more slender with shorter tips and with a tendency toward more green in the yellow coloring. It is an early variety, at Geneva 48 days to edible pod, coming in just after Challenge and about 2 days earlier than Pencil Pod or Sure Crop and perhaps 4 days earlier than Brittle Wax.

Plant medium to large, 14 to 16 inches high, 12 to 16 inches spread, rather erect, compact, without runners; vigor good, moderately productive with long bearing period. Stem stout, round, slightly ridged, branches few, rather long, being weighed down as pods enlarge but not enough to cause pods to rest on ground, wholly green. Foliage medium to abundant, rather coarse, rough-surfaced but not wrinkled, medium thick, leaflets large, about $4\frac{1}{2}$ by $3\frac{3}{8}$ inches, very broad from somewhat above base to near middle, round with short, blunt tips. Flowers bluish pink.

Pods borne intermediate among the foliage; medium light waxy yellow in color. Quality good to excellent, brittle, fleshy, stringless, quite fiberless and moderately fine in texture. Size long, rather narrow and quite plump ($5\frac{1}{2}$ -6 x $\frac{3}{8}$ x $\frac{5}{16}$ - $\frac{3}{8}$ inches), containing 5-6 seeds per pod. Shape round, nearly circular to cordate thru cross-section, much curved, occasionally scimitar-shaped, quite deeply creasebacked, slightly constricted, fairly well crowded, smooth, filled to the tip and edge and pointed at the end. Spur long, slender and recurved. Suture, placental is indented and carpellary obtuse.

Seeds medium in size, 1.45 x .5 x .55 cm., containing 70-75 seeds per oz. Shape oblong, subreniform, occasionally somewhat boat shaped, broad oval thru cross-section; ends abruptly rounded and occasionally ovalate. Hilum medium and flat having a tendency for a portion of the placental suture to adhere to it. Color varying shades of tobacco brown splashed and mottled with (vina-ceous-cinnamon) over about half the surface.

Hodson Wax. Refs. 48, 91. Syns. Everbearing Wax, Golden Queen, Hodson Long-podded Wax, Hodson Silver Wax, Hodson Wax Rustproof. This variety was first offered to growers in 1902 by the Harvey Seed Company of Buffalo. The exact origin is unknown, although the 1906 catalog of Josiah Young of Troy, N. Y., says, "A grand early variety which originated near Buffalo." Because of its resemblance to Hodson Green Pod, it may have originated as a sport from a planting of that variety. Hodson Wax quickly became

popular. It was listed by Henderson in 1906, by Thorburn in 1907, and by 1921 it was carried by over 100 seedsmen. The pods of Hodson Wax are large and handsome, making a striking appearance for exhibition. It is grown in the South for shipping, and also in parts of this State for shipment to the New York markets. The pods require 62 days to the first picking, making this the latest of our well-known varieties. It is about the same in season as Refugee, but 6 days later than Refugee Wax, and 12 days later than Pencil Pod or Sure Crop. In foliage characters the plants are most like Late Refugee, the pods resemble those of Davis Wax, but are larger and perhaps even tougher; and the seed is similar in color to seed of Red Valentine, but is larger and longer.

Plant large, 15 to 20 inches high with spread of nearly two feet, rather sprawling in habit, without runners, extremely vigorous, hardy, very resistant to rust, long in bearing season, very heavily productive; stem moderately stout, fairly rigid, round to oval, ridged slightly; branches long, rather slender, widely spreading, drooping or trailing, sometimes runnerlike, green thruout. Foliage very abundant, dense, similar to that of Refugee varieties, but on a larger scale, dark green, dull, only slightly roughened, thin, almost lacking pubescence. Leaflets small, 4 to $4\frac{1}{2}$ inches long, $2\frac{3}{8}$ to $2\frac{3}{4}$ inches wide at one-third distance from base, margins straight or slightly outcurving toward stems and incurving toward long, slender, sharp tips. Flowers bluish pink.

Pods borne below the foliage, light waxy yellow in color. Quality poor to fair; rather tough, stringy, and of coarse texture. Size long, medium broad and slender ($6-7\frac{1}{2}$ x $\frac{1}{2}$ x $\frac{5}{16}$ inches), containing 5-7 seeds per pod. Shape flat, ovate in cross-section, straight to slightly curved, straight backed, regular, not crowded, smooth, filled to the tip and edge, and tapering at the end. Spur long, slender, and straight or slightly curved. Suture, placental is flat to slightly indented, and carpellary, acute.

Seeds medium to large, 1.5 x .7 x .6 cm. (65-70 per oz.), subreniform to somewhat cylindrical, plump to somewhat flattened; abruptly rounded, and rarely truncate ends. Hilum small, flat. Color reddish purple (garnet brown to ox-blood red) splashed with pale buff (pale pinkish buff) over entire surface. Quite similar to Red Valentine in this respect.

Horticultural Wax. Refs. 47, 49. This is a variety without real merit that originated before 1896. It was introduced by Rawson as a Golden Wax x Dwarf Horticultural cross. It was highly praised at first but was not adopted by growers generally and soon disappeared. It was quite early, very productive, unusually free from anthracnose, and had rich yellow, straight, oval pods of poor quality.

Plant large, erect, vigorous, runnerless; foliage of medium size and color; flowers blushed. Pods about $5\frac{1}{2}$ inches long, straight, with long-rounded ends and rather long, stout, straight, central tips, about $\frac{1}{2}$ inch wide, broad-ovate in cross-section, rich yellow in color. Seeds about 6, crowded in pod, not quite $\frac{1}{2}$ inch long, very broad oblong in shape or broad oval with truncate ends, $\frac{3}{4}$ as wide as long, flattened, intermediate in color and patterning between seeds of Horticultural and Red Valentine types, purplish red in heavy patches showing small areas of pale buff.

Ideal Wax. No trial record of this variety has been found. It supposedly originated with Keeney and was distributed only by him. It was hardy, very productive, late, with round, yellow, stringless pods of fine quality; seeds white.

Jones Stringless. Refs. 41, 48, 91. Syns. Imperial White Seeded Wax, Jones Stringless Round

Pod. This is the best of the varieties originated by A. N. Jones, LeRoy, N. Y., and was said to have originated as the result of 5 years of systematic cross-breeding between Yosemite Wax and the white-seeded Crystal White Wax or Ivory Pod Wax. This variety, therefore, is a half-sister of Golden Crown introduced in 1899. Jones Stringless was introduced by several seedsmen in 1898. Although bearing pods of good quality, this variety never became very popular. The last few seasons seed purchased as Jones Stringless gave plants and pods identical with the Improved Strain of Davis Wax. Early in season, the pods resemble those of German Black Wax, although they are smaller and a lighter yellow and pods at green shell stage do not show reddish tinge at stem end. The seed and flowers are white, a combination in the Wax Pods found only in Crystal Wax, Asgrow Wax, and Davis Wax.

Plant medium, 12 to 14 inches tall, erect but spreading when pods mature, runnerless, green throughout, moderate in yield and bearing period. Foliage medium abundant, leaflets medium, dark green. Flowers white.

Pods borne intermediate among the foliage; light yellow in color. Quality good; fleshy, stringless, nearly fiberless, quite tender and moderately fine in texture. Size long, quite broad and rather slender ($5\frac{1}{2}$ -6 x $\frac{5}{8}$ x $\frac{3}{8}$ inches), containing 5-6 seeds per pod. Shape flat, ovate in cross-section, straight, straight backed, regular, not crowded, smooth, filled to the tip and edge and moderately rounded at the end. Spur long, slender and straight. Suture, placental is flat to somewhat rounded and carpellary, distinctly acute.

Seeds medium, 1.45 x .65 x .6 cm. (75-80 per oz.); moderately plump, reniform, oval in cross-section; ends uniformly rounded. Hilum medium, protuberant. Color dull white over entire surface, quite distinctly marked with gray vein-like underpattern and a very pale yellow, narrow eye-ring.

Keeney Rustless Golden Wax. Refs. 41, 47, 48, 49, 87, 91. Syns. Farquhar's Rustless Golden Wax. This member of the Golden Wax group departs considerably from the group type in character of plant. Burpee and others in 1895 made the original introduction to the trade, having secured seed from Keeney, the originator. The pods and seeds are very similar to Golden Wax, but its habit of growth is distinct among garden beans. In some respects the foliage resembles the Refugee type of foliage. It is possible that Rustless Golden Wax may be a natural hybrid between Refugee and Golden Wax. A comparison with Golden Wax shows foliage smaller and more slender. The leaves have a peculiar surface and easily turn in the wind and in growth, showing the underside which is grayish green in color. The pods are slightly longer, color more promptly, and become a deeper yellow and the seeds are larger with more purplish markings and with quite irregular outlines. Compared in season, it is 3 days later than the other Golden Wax varieties and 4 days later than Pencil Pod and Sure Crop.

Plant, growth habit unusual among the dwarf beans, medium in size, 14 to 15 inches high with spread of 14 to 18 inches; compact, upright in spite of many long drooping, almost runnerlike branches, by some called side wheelers; these short runners are very noticeable when plants are young but less prominent later and never long enough to interfere with cultivation; vigor good, very hardy, quite resistant to anthracnose, productive, continuous bearer, the first pods are set quite early close to the center of the plant, later

the plant puts forth short tendril-like runners on which pods are formed for late picking. Stem stout, tho rather flexible and long, round, ridged only slightly; branches slender, wholly green. Foliage abundant, dark green, dull, very flat, smooth surface, thin; leaflets $3\frac{1}{2}$ by $2\frac{1}{4}$, widest one-fourth the distance from base, straight sided, quite angular, long taper to sharp point. Flowers white.

Pods borne both above and below the foliage; deep, waxy yellow in color. Quality good, brittle, stringless, nearly fiberless and moderately fine in texture. Size moderately long, broad and fairly slender ($4\frac{1}{2}$ -5 $\frac{1}{2}$ x $\frac{1}{2}$ - $\frac{9}{16}$ x $\frac{1}{4}$ - $\frac{5}{16}$ inches), containing 5-6 seeds per pod. Shape flat; oval thru cross-section, straight to slightly curved, straight backed, regular, moderately crowded, smooth, filled to the tip and edge, and fairly well rounded on the end. Spur short, moderately stout and straight, although occasionally recurved. Suture, placental flat to somewhat rounded and carpellary, moderately acute.

Seeds large, 1.3 x .8 x .75 cm. (50-60 per oz.); short oval, very plump; ends rounded. Hilum small, flat or very slightly protuberant. Color white, indicating grayish vein-like markings on the dorsal surface, and blotched on the hilar surface with irregular splashes of light purplish maroon (dull indian purple) to (anthracene purple) and dark buff (vinaceous fawn) very similar to Golden Wax. A very dark buff eye-ring perceptible in most instances.

Kidney Wax. Refs. 9, 48, 69, 87, 91, 99. Syns. Burpee's New Kidney Wax, Fairfield Wonder Wax, Faribault Kidney Wax, Improved Butter Wax, Improved Kidney Wax, New Baltimore Stringless Wax, and Stringless Kidney Wax. Black-eyed Wax and Wardwell Wax were the parents used by Keeney to produce Kidney Wax, first introduced by Burpee in 1906. This popular wax pod is widely grown and sold under many different variations of the names given as synonyms. Seeds of these vary in color pattern in a minor way, but differences in plants and pods are rather difficult to detect. Faribault Kidney Wax as originally obtained in 1923 had seed with more coloring and larger eye-markings, but more recent samples bear close resemblance to Kidney Wax. The pods of Kidney Wax appear longer than Brittle Wax pods, because they are straighter. They are not quite so flat nor as wide as pods of Wardwell's Kidney Wax, but are slightly longer, straighter, and handsomer in appearance. Kidney Wax is a variety suitable for the home garden, market garden, or to grow for the cannery. To be at its best, the deep wax-colored, semi-round, stringless pods must be picked in early stages to avoid some fiber in pod walls. The long straight pods of Kidney Wax give an even cut and minimum amount of seed development. In season it is a second early, ready in 49 to 50 days, in season with Wardwell's Kidney Wax, Golden Wax, and Brittle Wax.

Plant similar in growth habit to plants of Brittle Wax, plant perhaps not quite as tall and growing slightly more erect. Pods borne both above and below foliage; medium to light yellow in color. Quality excellent; very brittle, stringless, nearly without fiber and of fine texture. Size short to medium, somewhat narrow, and plump ($4\frac{1}{2}$ -5 $\frac{1}{2}$ x $\frac{5}{16}$ - $\frac{1}{2}$ x $\frac{3}{8}$ - $\frac{7}{16}$ inches), containing 4-6 seeds per pod. Shape round, broad oval, much curved to scimitar shape, crasebacked, constricted, crowded, smooth, filled to the tip, and rounded at the end. Spur flexible, slender, medium long, more often straight than recurved, altho occasionally the latter takes precedence in some strains. Suture, placental is slightly indented and carpellary, obtuse.

Seeds medium to large, 1.5 x .7 x .6 cm. (72-80 per oz.), long, subreniform, plump, with abruptly rounded to truncate ends. Hilum small, flat to slightly protuberant. Color white, thru which

may be seen grayish vein-like markings; patterned with shining black, broad, irregular eye-ring.

King of the Wax. Refs. 87. Introduced the same year, 1896, to French growers by Vilmorin and to American gardeners by Dreer, King of the Wax had rather a short period of popularity, at least in this country. At the time of its introduction it was considered a dual purpose bean, the dry seeds being as well adapted for cooking and baking as the pods were for snaps.

Plants very much like those of Davis Wax, rather more stocky, very early, pods $4\frac{3}{4}$ to $5\frac{1}{2}$ inches long, $\frac{1}{2}$ inch wide, nearly round, strongly curved, very fleshy, swollen by beans, stringless and fiberless, very tender and of fine quality; seeds 4 or 5, almost identical with those of Davis Wax, but slightly broader.

Lemon Pod. Refs. 80, 81, 98. A variety grown for test at Geneva in 1883, in which year it was introduced by Everitt. It was said to be "almost identical with Ivory Pod Wax," under which name Crystal Wax was grown in 1882, but with pods quite distinctly yellow.

Plant strong, upright, but with many runners $2\frac{1}{2}$ to 3 feet long; foliage irregular in size and color; blossoms large. Pods broad, flat, wavy in outline, very wax-like, beautiful golden color, of best quality. Seeds white, variable in size and shape; late and less productive than Crystal Wax.

Leopard Wax. Refs. 48, 91. The parent stock for this introduction, made in 1905 by S. F. Leonard, was found in 1904 by an Indiana grower. While the pods were of rather good quality, the variety was never generally accepted as possessing better than average merit.

Plant very dwarf, under a foot tall, compact, dense until spread by weight of developing pods, runnerless; foliage large, coarse, rough, dark green, flowers bluish pink. Pods about $5\frac{1}{2}$ inches long, broad-ovate in cross-section, somewhat curved, broad, with rounded ends and short tips, most like those of Golden Wax but more curved and stockier. Light yellow, brittle, stringless, almost fiberless, of good quality. Seeds large, nearly 1.5 cm. long, $\frac{2}{3}$ as wide and half as thick, very broad oval with ends unequal, largely dark brown or bluish black with small, irregular whitish areas on one end and as broad along back quite distinct.

Lima Wax. Refs. 48, 49. The early popularity of this variety, originated with Rogers Bros. and introduced by several seedsmen in 1896, was undoubtedly due to the name. This was not based on any essential characters like pods or seeds, but on the fine, glossy foliage and peculiar, small flowers like those of dwarf limas.

Plant of medium size, slender-stemmed, very spreading, with many short, runner-like branches, often trailing on the ground; foliage fine, stiff, smooth, glossy; leaflets smaller than those of Refugee, but broad in proportion to length. Flowers small, white. Pod short, in shape like those of Burlingame field bean, but with shorter neck, straight, flat, very narrow ovate in cross-section with acuminate ventral edge, unfilled by beans, not fleshy, smooth-surfaced, greenish yellow or medium yellow, stringy, fibrous, rather tough, only fair quality. Tip very short, centered. Seeds white, ovate, small, about $\frac{3}{8}$ inch long, $\frac{1}{4}$ inch wide, and nearly as thick.

Long Dwarf German Wax. Refs. 97, 98. Syn. Dwarf German Wax. This white-seeded wax bean, grown in the early trials at Geneva and described by Wing, is inseparable in history and synonymy from White Wax. The description shows the plant as taller,

more branching, with darker green, more curly foliage, slightly longer pods, and longer, much more slender, kidney-shaped beans. These were more than $\frac{1}{2}$ inch long, $\frac{1}{4}$ inch wide, and only slightly flattened, weighing 85 to 90 to the ounce.

Lyonnaise Wax. Refs. 83, 90. This was a French variety evidently quite new when introduced into the United States by Noll in 1902. No detailed description has been found, but the wax-podded form was undoubtedly derived from White Lyonnaise and was similar to it in plant and seed.

Market Wax. Refs. 41, 48, 62. Henderson introduced Market Wax in 1902 having secured the seed from a grower in Genesee County, N. Y. In early descriptions it was said to combine the good qualities of Long Yellow Six Weeks with the qualities of a fine, flat-podded wax bean. Since Market Wax is similar in usefulness and value to Wardwell, this variety may have been the other parent. As compared to Wardwell, the pods are straighter, more stringy, and flatter without tendency to recurve, with longer points. The plants are more erect in growth with smaller, lighter-colored leaves. In season, second early, continuing to bear over a long period.

Pods quite attractive, medium yellow, of fair quality; containing when ripe 6 or 7 crowded seeds, rather more than half an inch long, about two-thirds as wide and half as thick, broad oval, oval oblong or ovate in outline, round oval in cross-section with short-rounded ends, sometimes truncate; straw yellow, olive yellow or coppery yellow in color, with darker eye-ring.

Maule Butter. Refs. 48, 91. This variety should not be confused with Maule's Improved Butter Wax since it is an old variety originated with Keeney and introduced by Maule in 1889.

Plant dwarf and spreading but runnerless; with foliage of medium size, broad, coarse, crumpled and wrinkled, thick, dark green. Flowers white. Pods about 5 inches long, decidedly curved with neck often bent back, heavy, "double-barrelled," sharply constricted between beans, with very short, thick tips, thick-walled, very brittle, stringless and fiberless, of excellent quality, deep yellow; seeds 5, crowded, practically same size, shape, color and marking as those of Keeney Rustless.

Michigan White Wax. Refs. 99. This is a strain of White Wax introduced by Ferry in 1907 as an improved strain, being earlier, more productive, and with better shaped pods. The original introducer also compared it with Ferry's Golden Wax, but claimed it superior to that variety in having a larger, more robust plant with heavier foliage and with white seeds.

Plant erect, with stout stem and very rigid branches, few to medium in number; foliage scanty to medium, dark to medium green, almost glossy, almost smooth medium in thickness; leaflets 4×3 inches for the terminals and a half-inch smaller in each dimension for laterals, widest one-fourth distance from base, sides slanting quite uniformly to rather short, sharp point. Flowers white.

Pods borne intermediate among the foliage; light yellow in color. Quality fair; brittle and stringless for a short time, later becoming tough, rather fibrous and coarse in texture. Size short, medium broad and slender ($3\frac{3}{4}$ – $4\frac{1}{2} \times \frac{1}{2} \times \frac{3}{8}$ inches), containing 5–6 seeds per pod. Shape flat, oval to broad oval in cross-section, slightly to moderately curved, humpbacked, regular, not crowded, smooth, filled to the tip and edge and rounded to truncate on the end. Spur short, thick and moderately curved. Suture, placental is slightly rounded and carpellary, obtuse.

Seeds medium, $1.1 \times .75 \times .6$ cm. (90 per oz.); oval, quite broad, fairly plump; ends abruptly rounded to truncate. Hilum small and decidedly protuberant. Color dull white, marked with a decided grayish vein-like under pattern.

Mohawk Wax. Refs. 9, 14, 29, 57, 59, 67, 68, 94. Landreth introduced this variety in 1903 as Landreth's Mammoth-seeded Golden Wax Mohawk. This name was changed at least three times, and we have selected the most characteristic. The variety is said to have come from a cross between Mohawk and the Crimson strain of Flageolet Wax. Though recommended as a triple-purpose variety, it never won a place, and was dropped within 10 years. It was very early and bore a heavy crop. Martens (*Gartboh.* 57. 1869), under *Phaseolus oblongus Sargentone*, or Bunte Weinbohne, describes a bean, seeds of which came to him from Canada and from Louisiana. Pods of this bean were straw yellow, flushed with brownish red and the seeds were like those of Mohawk.

Pods oval, stringless, 4 to 6 inches long and similar in shape to those of Mohawk or Long Yellow Six Weeks, but lemon yellow in color sometimes flushed rose. Seeds similar to those of Mohawk in shape and color, but apparently larger.

Monarch Wax. Refs. 48, 91. This is a little-known variety which originated with Darch and Hunter, a Canadian seed firm, in 1902, and except for descriptions by Tracy and Jarvis from the originator's seeds, seems to be unknown in the United States. It is similar in many ways to Wardwell Wax, but with foliage lighter colored, pods slightly shorter, stockier, and fleshy; and seeds less heavily marked.

Monster Stringless Wax. A lesser variety introduced by Vaughan in 1907 and still carried by him. Distribution was suspended at various periods through the failure of seed crops, or because the variety was considered rather too uneven in pods. In season it is slightly later than that of Wardwell and not as productive.

Plant very dwarf to bear such long pods, but stiff stems, rigid branches and curving of pod tips usually prevent soil staining; foliage coarse dark green. Pods 6 to $6\frac{1}{2}$ inches long, but variable, very broad, almost $\frac{3}{4}$ inch, broad-oval in cross-section with obtuse ventral edge, decidedly curved toward tip, almost loment like, somewhat zig-zag thru swelling on opposite sides over alternate beans, ends rounded, almost blunt, with rather short heavy sharply pointed tip from dorsal edge. Stringless, almost fiberless, tender, of better than fair quality, waxy light yellow. Seeds much like those of Detroit Wax, but much larger, about 55 to the ounce, proportionately longer, distinctly oblong-ovate, and usually with smaller regularly outlined blotch about eye, occasionally with faint line over end of bean, but without "Butterfly" markings.

Napoleon Stringless. The Michigan Seed Company obtained this as the result of a cross between Yosemite and a white-seeded variety. The original description made at the time of its introduction in 1906 pictured a variety with long, round pods with strong yellow color, good in quality and white seeded.

Pencil Pod. Refs. 41, 48, 53, 69, 77, 91, 99. Syns. Golden Scimitar, Giant Stringless Wax, Round Pod Prolific Black Wax. By many considered the highest quality wax bean in the entire list, this variety stands as one of the best varieties originated through the efforts

of Calvin Keeney of LeRoy, New York. Johnson and Stokes were the introducers in 1900. The year this monograph was published Pencil Pod was offered by more seedsmen than any other variety. Davis Wax and Brittle Wax are its leading rivals for popularity. The evidence as to its true parentage is confusing. By many it is considered to be the result of a natural cross between Improved Prolific Black Wax and Round Pod Refugee Wax. The original seed, however, was grown in a patch of Prolific Black Wax where Mr. Keeney selected a few individual plants. Pencil Pod is grown widely by both home gardeners and market gardeners because of its fine quality and handsome appearance. It is unfortunate in having black seed, otherwise it would be equally popular as a canning bean. In season, intermediate at Geneva, the snap beans ready in 50 to 55 days, about 1 week later than Challenge Black Wax, 2 days later than Sure Crop, and 10 days earlier than Hodson Wax. Similar in season to Brittle Wax, Unrivalled Wax, and Golden Wax. Pencil Pod and Brittle Wax are similar in season, but the plants of Brittle Wax are somewhat smaller, more upright, not so spreading and open; the leaves are smaller and lighter green; the flowers white; and the seeds are quite different (white with black eye splashing). Pencil Pod differs from German Black Wax in having decidedly longer, straighter pods, being later in season, being more productive, and in having a much larger vine. Livingston's Pencil Pod introduced in 1899 (P. P. 1900) by the seed house of that name is entirely different.

Plant strictly dwarf, usually 12-15 inches high, 15-18 inches spread; stocky, rather erect, moderately open, spreading when fully grown, yet holding pods well off the ground; very vigorous, productive with long bearing season. Stem stout, rigid, round, smooth to slightly ridged; branches comparatively few, long. Green stemmed with slight show of purple at ends of branches, nodes and on flower stalk. Foliage abundant, of a rich, medium dark green; leaflets large and broad, thick in texture, rough crumpled, heavy veining, very slight fine pubescence, $3\frac{1}{2}$ -4 inches long, terminal one often nearly as broad, laterals decidedly narrower, broadest one-fourth distance from base, sides rounding to rather short, abruptly pointed tips. Flowers phlox pink.

Pods borne both above and below foliage; medium to light dull yellow in color. Quality excellent; fleshy, stringless, quite fiberless, and fine texture. Size medium to long, narrow, and plump ($5\frac{1}{2}$ -6 \times $\frac{1}{16}$ \times $\frac{3}{8}$ inches), containing 5-7 seeds per pod. Shape round, broad oval to nearly circular in cross-section, much curved to scimitar, creasebacked, regular, somewhat crowded, smooth, filled to the tip and edge, end pointed. Spurs medium long, fairly thick and slightly recurved. Suture, placental is indented somewhat and carpellary, rounded to obtuse.

Seeds medium, $1.5 \times .7 \times .7$ cm. (85-90 per oz.), oblong to subcylindrical, usually somewhat flattened, abruptly rounded to truncate ends. Hilum small, flat, portion of placental vascular tissue often adhering to it. Color shining jet black over entire surface.

Pink-Eye Wax. Refs. 14, 63, 84. This is closely allied to Golden-eyed Wax and was introduced by Landreth in 1889. The Kansas Station reported it as inseparable from Golden Wax, but with the spotted portion of the bean more restricted. Irish reports it different from Detroit Wax only in the pinkish color of the markings. It was listed by about a dozen seedsmen in 1901, but is now unknown. The Pink-eye



PROFUSION WAX

(Natural size)



NEW WAX

(Natural size)

grown in our recent tests is green-podded, with longer seeds.

Prolific Black Wax. Refs. 9, 45, 48, 84, 91, 93, 94. Syns. Butter Stringless, Cylinder Black Wax, Improved Black Wax, Prolific German Black Wax. This old variety, which has outlived its parent, originated from several plants selected by Calvin Keeney and W. W. Tracy, Sr., in a field of German Black Wax in Genesee County, N. Y., and was introduced in 1888 by several seedsmen. The chief points of difference between this variety and the parent German Black Wax are season, which is from 1 to 3 days earlier, pods that show a weaker yellow color with a shade of red on neck and a reddish line along both sutures, and flower stalks and branches that show more purple. The pod size is slightly smaller, possibly $\frac{1}{4}$ to $\frac{1}{2}$ inch shorter, straighter, and more slender. The plant has less coarse foliage, with smaller and smoother leaves; similar to German Black Wax.

Pods borne mostly below the foliage, light yellow in color. Quality excellent; brittle, tender, entirely stringless and fiberless and moderately fine in texture. Size medium short, rather narrow and slender ($4\text{--}5 \times \frac{1}{8} \times \frac{3}{8}$ inch), containing 5–6 seeds per pod. Shape round, nearly circular in cross-section, scimitar curved, straight to slightly creasebacked, regular, very crowded, smooth, filled to the tip and the edge and nearly rounded at the end. Spur medium long, slender and curved. Suture, placental is flat to slightly indented and carpellary, obtuse.

Seeds small to medium, $1.15 \times .65 \times .45$ cm. (95–100 per oz.); oval, fairly plump to somewhat flattened; ends rounded and occasionally somewhat truncate. Hilum small, flattened with a tendency for a portion of the placental suture to adhere to it. Color shining jet black (similar to German Black Wax) over the entire surface.

Refugee Wax. Refs. 15, 41, 47, 48, 49, 56, 59, 69, 77, 80, 81, 84, 91, 99. Syns. Bolgiano's New Wax, Epicure Wax, Eureka Everbearing Wax, Keeney's Refugee Wax, Livingston's Pencil Pod Wax, Profusion Wax. The form of Refugee Wax now grown was selected some time before 1897 by Keeney in a field of the old strain (with stringy pods) of Refugee Wax. This older form, or the first wax pod of this type, was introduced in 1890 by J. M. Thorburn & Co. as Thorburn's Refugee Wax, coming as a sport from Extra Early Refugee (greenpod). D. M. Ferry & Co. also offered an improved type which had been selected from the old Thorburn strain. In 1900, Livingston offered Livingston's Pencil-pod Wax. This was different from the Pencil Pod Wax offered the same year by Johnson and Stokes and by Tracy was considered the same as the Stringless Refugee Wax. All strains of Refugee Wax grown at Geneva during the last few years have proved to be stringless. It is better known as a good all round sort, although its long season is attractive to both home gardener and canner. In canning quality it is probably second only to Brittle Wax and to New Kidney Wax, due to the somewhat light yellow color of the pods and a tendency to produce curved pods in dry season, as well as the dark seed coat color and the green color of smaller sized pods. A second early variety, 51 days to edible pods, the same in season as Brittle Wax, Pencil Pod, and Davis. The foliage can be compared only to other stocks of Refugee. The pods

probably most resemble Prolific Black Wax, although they are more slender, with a curved or hooked point and faintly splashed with purple.

Plant medium, 12 to 14 inches tall with spread of about 15 inches, appears to be quite spreading and squatty due to peculiar characteristic growth; vigor good, very productive over long season. Stem slender, base short, round, ridged above, internodes short; branches many, becoming almost runnerlike and with slender secondaries, often trailing, wholly green. Foliage dense, abundant, dark grayish green, dull, smooth surface, finely veined, thin; leaflets very small, $2\frac{3}{4}$ to $3\frac{1}{2}$ inches long, slender, only about $1\frac{3}{4}$ to $2\frac{1}{3}$ inches wide at more than one-third distance from base, with sides almost straight or gently incurved to long rather sharp tips. Flowers phlox purple.

Pods borne mostly below foliage; light yellow, splashed with purple color in green shell stage. Quality good; brittle, tender, stringless, nearly fiberless and occasionally slightly coarse in texture. Size short to medium, medium to broad but quite plump ($3\frac{1}{2}\text{--}5 \times \frac{3}{8}\text{--}\frac{7}{16} \times \frac{3}{8}$ inches), containing 5 seeds in a pod. Shape nearly round circular to cordate in cross-section, much curved, straight-backed, regular, occasionally slightly crowded, smooth, filled to the tip and edge, and rounded to truncate on the end. Spur medium short, thick, and recurved. Suture, placental is flat to slightly indented and carpellary, rounded.

Seeds medium, $1.3 \times .7 \times .6$ cm. (100 per oz.). Subcylindrical or very slightly reniform, nearly circular in cross-section; abruptly rounded to somewhat pointed ends. Hilum small, flat. Color dark bluish-black (urania blue) mottled with pale buff (tilleul-buff) over the entire surface.

Royal Purple Wax. Syns. Mammoth Stringless White Pod, Royal Wax, Stringless Yellow Pod. This variety, which has found its usefulness chiefly in the midwest, originated about 1900 as a sport in a field of beans grown in Michigan by H. A. Johns, then president of the Sioux City Seed Company. Mr. Johns found the single plant and saved some seed. Since the pods were very attractive, the stock was increased and introduced to the trade as Royal Purple Wax. Seed of this variety is quite individual in shape and color, indicating that it is probably a hybrid. Nothing is known as to the name of the variety growing in the field where it was found. At Geneva it was one of the earliest with pods ready to pick in 47 to 49 days, only a day or so later than Challenge. In length and plumpness the pod resembles Challenge Black Wax but is somewhat broader and lacks the long slender tip as well as being of a deep waxy yellow color. It compares with Crystal White Wax in tenderness. The foliage resembles that of Valentine Wax.

Plant small to medium, 12 to 14 inches tall with spread of 15 to 17 inches; erect, compact, runnerless; vigor good, yield moderate over fairly long season; stems stout, round, internodes short; branches few, green throughout. Foliage abundant, medium to dark green, dull, only slightly roughened, medium veined, thick; leaflets $3\frac{1}{2}$ inches long, 3 inches wide, terminal leaflet quite rounded, side leaflets more quadrangular. Flowers rose purple.

Pods borne very largely above the foliage; medium light yellow in color, later slightly tinted with purple. Quality good to excellent; stringless, fiberless, brittle, quite fleshy but rather coarse in texture. Size medium long, broad and quite plump ($4\text{--}5 \times \frac{7}{16}\text{--}\frac{1}{2} \times \frac{1}{8}$ inches), containing 5–6 seeds per pod. Shape round, nearly circular in cross-section, much curved, distinctly creasebacked, moderately constricted, not crowded, smooth, filled to the tip and the edge and moderately rounded on the end. Spur moderately long, stout; slightly curved and then recurved. Suture, placental is indented and carpellary, decidedly rounded.

Seeds medium small, 1.2 x .75 x .65 cm., containing 75-80 seeds per oz. Shape very short oval, plump, broad oval thru cross-section; ends abruptly rounded and occasionally somewhat truncate. Hilum small, flattened. Color dark reddish purple (dark perilla to deep livid purple) and sparsely splashed with a tawny drab (light vinaceous cinnamon). Occasionally a narrow eye-ring of the same color is apparent.

Speckled Wax. Refs. 13, 48, 49, 58, 59, 67, 68, 85, 91. This variety was introduced by Buist in 1887, had a limited distribution up to 1901, was still carried by one seedsman in 1906, and then disappeared.

Plant large, erect, vigorous, hardy, with abundant, coarse, dark green foliage like that of Kidney Wax. Flowers pink. Pods straight, round, tender, stringless in early stages, but tough, quite stringy and fibrous later, yellowish waxy white in color splashed with crimson when at green-shell stage. Seeds $\frac{5}{8}$ inch long, half as wide, broad oval as viewed sidewise, narrow-oval or oblong with rounded ends as seen from edge, reddish buff, sparingly splashed reddish purple which soon changes to dark seal brown or black. Seeds much like those of Dwarf Golden Carmine, recently introduced; and quite unlike Hardy Wax or Hodson Wax.

Stringless Wax. Two varieties are included under this name because of the extreme similarity of their seeds, which are indistinguishable from those of the parent variety, Burpee Stringless Green Pod, and because of certain general resemblances between them. Olds Late Stringless Wax was introduced by Olds in 1921, and as tested here clearly shows its relationship to Burpee Stringless Green Pod, although somewhat smaller in plant, with longer, more slender leaflets, and with rounder, more curved, slightly more slender pods rather slow in yellowing. The pods are of good color when ready, stringless and fiberless, fine in quality, but a trifle coarser in texture than Pencil Pod. The variety follows Early Stringless Wax in season and was among our most productive wax pod varieties. Stringless Wax of the Portland Seed Company was introduced by them in 1928. From one season's test at Geneva it appears similar to the variety above, but with straighter, longer-tipped pods, decidedly earlier in season, and edible pods produced over a longer period.

Sure Crop. Refs. 77. Syns. Monarch Wax, New Sure Crop Stringless Wax, Sure Crop Stringless Wax, Yellow Bountiful. Sure Crop has gradually increased in importance until it ranks as a leading flat-podded wax bean. It originated with Keeney and was introduced by Dreer, Thorburn, and others about 1911. In many ways it resembles Currie Wax and is said by some to be a selection from it. However, uncertainty in the originator's notes makes it impossible to determine which view is correct. It is a leading sort for home or market use because of the attractiveness and the excellent quality of the pods. One of the early varieties, 49 days at Geneva, only a few days later than Challenge; in season with Pencil Pod, Wardwell's and Cracker Jack. The variety is very much like Currie Wax, but with pods of better quality being entirely without string. Sure Crop is practically indistinguishable from Yellow Bountiful. Earliest Market is similar to Sure Crop but has pods with more string, as indicated by the rigid tip of pod.

Plant large, 14 to 16 inches high with spread of 15 inches, spreading but runnerless, compact; vigorous, productive over long

bearing season; stem moderately stout, comparatively few branches, green thruout. Foliage medium to abundant, medium green, rough crumpled, thick; leaflets large, $4\frac{3}{4} \times 4\frac{3}{4}$ inches, widest one-third to one-fourth the distance from base, roundish or almost quadrangular, sides slightly incurving just before short abruptly pointed tips. Flowers rose purple.

Pods borne intermediate; medium dull yellow in color. Quality very good; brittle, stringless, with small amount of fiber and fine textured. Size medium long, slender and fairly broad, ($5-5\frac{1}{2} \times \frac{1}{2} \times \frac{3}{8}$ inches), containing 5-7 seeds per pod. Shape flat, ovate in cross-section, straight to slightly curved, straight backed, regular, crowded, smooth, filled to the tip, and rounded at the end. Spur long, slender and straight to slightly curved. Suture, placental is very slightly indented to flat and carpellary, acute.

Seeds medium, 1.5 x .7 x .6 cm. (70-75 per oz.), oval to subreniform, fairly plump; abruptly rounded to occasionally truncate ends. Hilum small, flat to slightly protuberant. Color shining jet black over entire surface.

Unrivalled Wax. Refs. 13, 51, 93, 94. This variety first appeared in the catalog of Vilmorin-Andrieux & Company in 1909 as Haricots beurre nain sans rival. At the time of its introduction it was described as a variety with beautiful yellow pods which were fleshy and absolutely without parchment. Apparently it was brought to America by D. M. Ferry & Company of Detroit since its first offering in this country was in their catalog of 1913. Its parentage is not given. In 1921 it was listed in only seven catalogs, while in 1931 approximately one-fourth of all companies issuing catalogs list Unrivalled as a worthwhile sort. However, since the pods are relatively narrow, long, and slender, it is probable that Unrivalled will not be able to compete with Pencil Pod or Sure Crop as a market bean nor with Kidney Wax as a canning variety. Its earliness and good quality should aid its popularity for a home garden bean. It also has the reputation of doing well under drought conditions. The pods show clear yellow color at an early stage, and therefore can be picked as butter beans when quite small. At Geneva its season was 50 days, about the same as Golden Wax and Pencil Wax.

Plant very dwarf, erect, stocky, often only from 9 to 12 inches high and with an average spread of about one foot, indicating a rather small plant. Stem stout, round, smooth; branches few, rigid, and holding pods well off of the ground. Moderate in vigor but yield good for size of plant. Foliage medium and moderately abundant, dark green, glossy, smooth, rather thin, veiny, light; leaflets long, 4 to $4\frac{1}{2}$ inches, slender, $2\frac{1}{2}$ to $2\frac{3}{4}$ inches wide, greatest width very near base with sides of leaflets almost straight and rather long; tips moderately taper-pointed. Flowers bluish pink.

Pods borne intermediate; medium light dull yellow in color. Quality good; brittle, tender, stringless, quite fiberless but somewhat coarse in texture. Size short to medium, rather narrow and slender ($4\frac{1}{2}-5 \times \frac{3}{8}-\frac{1}{2} \times \frac{1}{4} \times \frac{5}{16}$ inches), containing about 6 seeds per pod. Shape flat, oval to ovate in cross-section, slightly curved, straight backed, regular, not crowded, smooth, filled to the tip and edge, and rounded at the end. Spur moderately long, slender and straight with a slight tendency to recurve. Suture, placental is flat to very slightly indented and carpellary, acute.

Seeds very small to small, 1.1 x .5 x .45 cm. (145-150 per oz.), long oval to cylindrical, slightly subreniform, plump; rounded to somewhat truncate ends. Hilum small, flat. Color bright golden fawn to golden brown (tawny) over entire surface, marked with narrow, dark olive green to brown eye-ring.

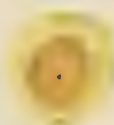
Valentine Wax. Refs. 3, 16, 47, 48, 87, 91. Syns. Golden Stringless, Miller's Early Golden Stringless.



MAMMOTH STRINGLESS WHITE POD WAX



UNRIVALLED WAX



STRINGLESS YELLOW POD WAX



WHITE WAX BUSH





SADDLE BACK WAX

(Natural size)

Thorburn in 1885 offered a new improved Extra Early Valentine with wax pods which was said to have originated with T. V. Maxon, Jefferson County, N. Y. The color of the seeds indicates a close relationship to Red Valentine. As a member of the Valentine family, at one time it was quite widely grown, but of late years it is seldom offered since in trial it has proved to be lacking in vigor and yield. It always was among the earliest of wax podded varieties, 47 days at Geneva, which is only 1 day later than Challenge Black Wax. The pods are larger, straighter, and lighter in color with longer tips than the pods of Challenge Black Wax, while the plant is much smaller and more bushy. It differs from its parent variety in color and stringlessness of pods, as well as in having somewhat wider leaflets and a more compact plant.

Plant small, 1 foot tall or less, with narrow spread in row, erect, compact, without runners; not especially vigorous, of weak growth, low productivity with short bearing period. Stem slender, branches low and few, green throughout. Foliage medium in amount, dark to medium green, smooth, dull, thick; leaflets 4 inches long, $3\frac{1}{8}$ inches wide near base, margins rounding to stem and almost straight to poorly defined short tip. Flowers bluish pink.

Pods borne mostly above the foliage; medium yellow in color. Quality fair to good; brittle, stringy, practically fiberless, but rather coarse in texture. Size medium short, rather narrow, and fairly plump ($4\frac{1}{8}$ -5 x $\frac{3}{8}$ - $\frac{7}{16}$ x $\frac{5}{16}$ inch), containing 4-5 seeds per pod. Shape round, fairly broad, oval to cordate in cross-section, moderately curved, creasebacked, regular, not crowded, smooth, filled to the tip and edge, and abruptly tapering at the end. Spur moderately long, quite stout, and straight. Suture, placental is indented and carpellary, obtuse.

Seeds medium, 1.3 x .7 x .6 cm. (85-90 per oz.), oblong, oval, somewhat cylindrical, plump, nearly round in cross-section; ends abruptly rounded and occasionally truncate. Hilum small, flattened. Color light fawn (vinaceous cinnamon) blotched and splashed over 95% of the surface with varying shades of dull red (vandyke to acajon red).

Wardwell Kidney Wax. Refs. 9, 14, 16, 30, 35, 41, 45, 47, 48, 49, 56, 58, 59, 61, 63, 66, 67, 68, 69, 77, 78, 84, 91, 93, 94, 99. Syns. Kidney Wax, Milliken's Wax, Wardwell's Delicious Wax, White Kidney Wax. On the trial grounds of Rogers Bros. and R. B. Hungerford, Jefferson County, N. Y., a seed of a new type was found and developed by Mr. Charles Wardwell sometime between 1880 and 1885. Several seedsmen introduced it about the same time, Thorburn in 1887 and Johnson & Stokes and Ferry in 1888. Whether or not this variety was a natural hybrid or came from a seed mixture from foreign sources is not known. There are several American varieties with seed of similar color and shape, but they had been known or commonly grown in this country before Wardwell's and were not seed of wax-podded varieties. Wardwell's is particularly valuable for the home and market garden, and has been long used as a main crop variety which, under good growing conditions, yields an abundant crop on rather showy plants. An early sort with pods ready in 48 days at Geneva, 3 days behind Challenge Black Wax but in season with Sure Crop and Pencil Pod. Perhaps this variety is most like Golden Wax, although 2 or 3 days later. The pods are about 1 inch longer than Golden Wax pods, a trifle wider and slightly curved

backwards at the stem end, while the spurs are smaller and start more from the center of the end of the pod. The plant itself is rather distinct in its somewhat low heavy open growth.

Plant medium, height 12 to 15 inches, with spread of about 14 inches in row; fairly erect, somewhat spreading, with few spreading branches, very open plant without runners; vigor good, bearing period and productiveness only moderate. Stem stout, ridged, internodes short, branches few, green thruout. Foliage scanty to medium, dark green, glossy, slightly rough surface, thick, crumpled, rather coarse looking; leaflets about 4 inches long, 3 inches wide, widest $\frac{1}{3}$ distance from base, quite round without distinct shoulders, moderately long, rather obtuse, points slightly curved just before tip. Flowers white, cream with age.

Pods borne below the foliage; medium dull yellow in color. Quality fair; practically stringless, fairly brittle, some fiber, and rather coarse in texture. Size long, broad, and rather slender ($5\frac{1}{4}$ -6 x $\frac{1}{2}$ x $\frac{1}{4}$ inches), containing 5-6 seeds per pod. Shape flat, long oval or narrow ovate in cross-section, straight to slightly curved, straight backed but occasionally slightly creasebacked, regular, fairly crowded, smooth, filled to the tip and edge, and rounded to blunt on the end. Spur very short, stout and straight. Suture, placental is slightly indented and carpellary, acute.

Seeds medium to large, 1.5 x .8 x .6 cm. (55-60 per oz.); oblong, reniform, fairly plump to somewhat flattened; ends rounded and occasionally truncate. Hilum small, flat to slightly protuberant. Color dull white, thru which may be seen grayish vein-like markings; mottled and speckled irregularly with tawny yellow, auburn brown and a slight tinge of light purple on the whole or part of the hilar surface, parts of one or both ends, and occasionally it may appear to some extent on one or both sides. In most instances the shading is distinctly lighter at the hilum.

White Flageolet Wax. Refs. 47, 63. This is a German variety which originated about 1896 and which was included in the trials at the Missouri Botanical Garden. It was found to be identical with the field bean White Flageolet except for its bright yellow, tender pods.

White Stringless Wax. This was a novelty introduced by Vaughan in 1928 and tested here for one season. It is probably a selection from Davis Wax, the seeds of the two varieties being practically indistinguishable. Those of the new strain, however, were slightly smaller with a smooth, glossy surface.

Plant small, less than 1 foot tall, with large, light yellowish green foliage, showing some disease late in season, after pods have escaped serious injury. Pods very long, $6\frac{1}{4}$ to 7 inches, with slender necks from very small receptacles, less than $\frac{1}{2}$ inch wide, semi-round, oval in cross-section, slightly constricted between beans or with zig-zag effect due to protrusion on opposite sides of alternate beans, much curved as would be expected from stringless pods, ends rounded, with rather long, slender, flexible tips from near centers, walls quite thick and fleshy, brittle, stringless, fiberless, medium in texture, of good quality. Seeds as above about 75 to the ounce.

White Wax. Refs. 16, 47, 56, 61, 93, 94, 97, 98. This very old variety probably came from Germany as it was known to Martens. Burr, however, writing in America at about the same time, describes no dwarf wax bean. It undoubtedly split up into various types and strains, all of which have long since disappeared. With one exception, we have no way of separating the strains, and are wholly unable to group the synonyms for the two types described by Wing. From tests at this Station in 1882 and 1883, he describes one strain as follows, probably grown under unfavorable conditions:

Plant very dwarf, not over $\frac{1}{2}$ foot tall, stocky, not much branched, not twining; foliage not very abundant, medium green, not wrinkled; leaflets of medium size, broadly ovate, inclining to lozenge shape, moderately taper-pointed, laterals often irregularly developed. Flowers white. Pods $2\frac{3}{4}$ to $3\frac{1}{2}$ inches long, slightly curved, swollen by beans, with slender, slightly curved tip of medium length (others say almost translucent, butter yellow, quite broad, without string or fiber, but of only medium quality). Seeds 2-3 (others 4-5); irregularly globular or slightly oblong, usually flattened sidewise, eye flat or slightly protuberant, pure white, average size slightly more than $\frac{3}{8}$ inch long, more than $\frac{1}{4}$ inch wide and $\frac{1}{4}$ inch thick, about 75 to the ounce.

Yellow Princess. Ref. 47. Yellow Princess has been known in Germany for many years, certainly since 1873, and was probably one of the types known to Martens 10 years before. It was never widely known in America and disappeared long ago. Since Goff's description is uncertain, the following has been compiled from Irish and Denaiffe:

Plant $\frac{3}{4}$ to 1 foot tall, moderately vigorous, very productive, quite late; foliage medium green, slightly wrinkled; leaflets 3 to $3\frac{1}{2}$ inches long, 2 to $2\frac{1}{2}$ inches broad, slender, sharply taper-pointed. Flowers white. Pods $3\frac{1}{2}$ to 5 inches long, $\frac{1}{2}$ inch or more broad; almost as thick, stocky, slightly constricted between beans, with long rounded to short rounded ends, with short, rather heavy, curved tip; fleshy, tender, almost fiberless, stringless until seeds enlarge, yellow. Seeds 5 or 6, sometimes 7, $\frac{3}{8}$ to $\frac{5}{8}$ inch long, two-thirds to three-fourths as broad, more than half as thick, yellowish brown with darker eye-ring.

Yellow-Podded Princess. Refs. 98. This was an old sort of unknown origin but listed by Sibley in 1883 and tested at this Station that year. Here it was confused with Yellow Princess from Germany which had brownish yellow seeds. Comparative dates show that edible pods were produced nearly a month later than those of White Wax and a week later than those of Yellow Princess.

Plant strictly dwarf. Pods yellow, stringless, tender, of fine quality. Seeds small, oblong, slightly flattened sidewise, occasionally compressed at end, eye-side flat, pure dead white, distinguished from White Wax by smooth, rounded form and lusterless white.

Yosemite. Refs. 9, 16, 23, 27, 29, 35, 41, 45, 47, 48, 49, 59, 61, 67, 68, 81, 84, 85, 91. Syn. Yosemite Mammoth Bush Bean. This variety represents an outstanding type which originated with N. B. Keeney & Son, LeRoy, N. Y. It was said to have come from a single plant found in a field of White Wax Bush. It was introduced in 1889 by Peter Henderson and soon was a very popular variety. Because of its great vigor and large pods it has been used as a parent for many bean crosses. It is nearly 35 years since it was introduced and today there are strains which seem to have deteriorated from the original description as given for this variety. Some of these strains seem to be more like Celestial Wax which is a selection from the Currie Wax. Yosemite should still be a favorite variety to use as one parent in making known crosses with the hope of improving existing varieties.

Season 52 to 55 days, a midseason variety, about 10 days earlier than Hodson Wax, 3 or 4 days later than Pencil Pod and Round Kidney Wax. Yosemite is not like any other variety, being individual in both pod and plant characters. In some ways it seems like a very

vigorous Pencil Pod, but the plant is much more spreading with more branches.

Plant large, probably the largest of the black seeded wax type, strictly dwarf with no runners, heavily branched, drooping as pods reach picking stage, stocky, erect, vigorous with pods mostly hidden by the foliage in bearing season; height $1\frac{1}{4}$ feet with spread in row of $1\frac{1}{2}$ feet. Stem stout, slightly ridged, long internodes, many branches, very slightly tinged with red at nodes. Foliage abundant, medium green, rough surfaced, crumpled and thick, heavy vined, slightly pubescent; leaflets very large, very broad nearest base, slender pointed. Flowers rose purple.

Pods borne mostly below the foliage; light yellow in color. Quality excellent; stringless, fiberless, brittle, tender, and of fine texture. Size long, moderately broad but very plump ($5\frac{1}{2}$ - $6\frac{1}{4}$ x $\frac{1}{2}$ x $\frac{3}{8}$ inches), and containing 5-6 seeds per pod. Shape round, very broad oval in cross-section, deeply creasebacked and indented on the carpellary suture suggesting a "double-barrelled" likeness, S-curved as well as twisted sideways occasionally, constricted, fairly smooth, filled to the tip and blunt to rounded on the end. Spur long, moderately stout and curved. Sutures, placental and carpellary are both indented.

Seeds medium, 1.5 x .7 x .6 cm. (75-80 per oz.); oblong, occasionally subreniform, plump; ends rounded and quite frequently one is larger than the other. Occasionally a rather prominent dorsal ridge is apparent giving the bean a boat-like shape. Hilum small, flat, with a tendency for a portion of the placental suture to adhere to it. Color shining jet black over the entire surface after the bloom has been removed.

THE HORTICULTURAL OR SHELL BEANS

The horticultural class of beans is represented by a small group of varieties all of which have been in existence for a considerable time. These varieties are characterized by their smooth, flat, dark-colored leaves; by the pods which, in the green shell stage, are abundantly and brilliantly splashed with carmine or red and which are much swollen over the seeds; and by large tumid seeds with white or light buff undercolor more or less splashed and streaked with dark red.

Burr says the horticultural beans were introduced into this country from England about 1825, but present-day catalogs of seedsmen of that country do not list these varieties and it is doubtful if the climate is adapted to their growth. The New Zealand Runner Kidney bean (Haricot de Prague Mabre) and the Araucano bean of Chili are probably the parent stocks of our present varieties. In California this class of bean is known as Cranberry Bean and is grown for the dry beans which are largely sent to eastern markets, particularly for use in the mining districts. Eastern seedsmen have listed horticultural varieties since their first lists were published about 1822. There has been little improvement in the type as offered, the changes occurring having been directed toward producing strains with larger pods with better color. As a shelled bean, both in the green state and for dry seeds, the horticultural beans are remarkably farinaceous, well-flavored, and worthy of more extended use.

POLE VARIETIES

Brockton Horticultural Pole. Refs. 48, 91. Syns. Brockton Horticultural, Low's Brockton. While this is a relatively little-known variety of the horticultural class, it bears the same relation to the horti-

cultural poles that the Goddard does to the dwarfs, being exceptionally strong growing and vigorous. A gardener near Brockton, Mass., had some pods on the Brockton market where they were noticed by the Aaron Low Seed Company, who secured seed and introduced the variety in 1885. The pods are most handsomely splashed, resembling in that respect Golden Carmine. The pods also resemble those of Goddard Bush but are flatter and longer.

Plant of large growth, slow to start but covering the trellis well later; branches wholly green; leaflets large, long, long-pointed, smooth, flat, dark green. Flowers pink.

Pods dark green in color but splashed with dull red in green shell stage. Quality poor; stringy, fibrous, tough, and rather coarse in texture. Size long, very broad and slender, ($7-8 \times \frac{3}{4} \times \frac{5}{8}$ inches), containing 5-6 seeds per pod. Shape flat, elliptic in cross-section, straight, flat to slightly creasebacked, slightly constricted, not crowded, smooth, filled to the tip and edge and sharply tapering at the end. Spur very long, slender and uniformly curved. Suture, placental is slightly indented and carpellary, moderately acute.

Seeds large, $2.1 \times 1. \times .8$ cm. (45-50 per oz.); long reniform, long oval thru cross-section, fairly plump to somewhat flattened; ends uniformly rounded. Hilum small, flat to slightly indented. Color light fawn (pale pinkish buff) sparingly splashed and streaked with dark purplish red (violet carmine).

Child's Horticultural. Refs. 48, 91. John Lewis Childs secured the stock of this variety from a farmer's garden in North Jay, Me., and offered seed in 1891. In the original description it was said to be an improvement on the well-known horticultural bean in having pods in clusters and in being more brilliantly splashed with carmine than London Horticultural. In all respects plant, pods, and seeds most closely resemble Brockton.

Pods like those of Brockton, shorter, broader, having thicker necks and shorter tips, more curved, of even poorer quality as snap beans; rather more productive, with pods in clusters, of same or later season; very attractively marked; containing 6 to 7 seeds, shorter and proportionately more plump, with darker background and less pronounced markings.

Concord Pole. Refs. 48, 91, 97. Syns. Big Sioux, Hemisphere, October Pole. The first mention of Concord was during the period between 1860 and 1865. The original plant was found in a garden in Concord, Mass., and by some is said to have been a natural hybrid between Lazy Wife and Early Horticultural, others giving the parents as London Horticultural and White Cranberry. It is very similar to Mottled Cranberry, but seed color is rather more buff drab or light brown than crimson.

Plant similar to Brockton, perhaps more open in growth, with lighter foliage, abundant; leaflets broadly wedge obvate, slightly taper pointed. Flowers white.

Pods medium green in color. Quality poor; stringy, moderately fleshy, quite tough, fibrous and medium coarse texture. Size medium long, very broad and quite slender, somewhat shorter and broader than either Brockton or Childs ($5-5\frac{1}{2} \times \frac{3}{4} \times \frac{5}{8}$ inches), containing 5-6 seeds per pod. Shape flat, elliptical in cross-section, slightly curved, straight backed, slightly constricted, not crowded, rough surfaced, filled to the tip but not to the edge and rounded to moderately tapering at the end. Spur similar to Brockton, long, moderately slender, and uniformly but slightly curved. Suture, placental is flat and carpellary, acute.

Seeds large, $1.5 \times .95 \times .8$ cm. (55-60 per oz.); short, broad oval, plump, broad oval in cross-section; ends rounded and occasionally slightly compressed. Hilum medium, flat to slightly protuber-

ant, hilar surface somewhat raised at the immediate vicinity of the eye. Color two-thirds of the surface, including the upper portion of the sides, ends and all of the dorsal surface, white. Hilar surface marked with a distinct area of light dun (pinkish cinnamon) splashed and mottled with dull red (morocco red) and a moderately wide yellowish (zinc orange) eye-ring.

Crosby Horticultural. Refs. 63, 90. Syn. Horticultural Cranberry. This variety was named for a distinguished Massachusetts gardener, Josiah Crosby, of Arlington. Farquhar, in 1890, introduced the stock as the earliest of the pole horticulturals.

Plant large grower, leaflets medium to large. Pods 3 to 4 inches, flat, curved, thick. Seeds roundish oval, plump, light brown, splashed with brownish red.

Early Horticultural. Refs. 48, 90, 91. Syns. Early Pole Horticultural, Little Gem, Little Wonder. This bean was grown privately by gardeners near Worcester, Mass., and was introduced by Ross Bros., in 1902. It was listed but a short time and was popular only in a very restricted area. The plants lacked vigor and productiveness, yet while the snap pods were stringless they were too coarse-grained and of too poor quality for wide use. The older pods were difficult to shell for the green beans.

Foliage dark green, long, very flat leaflets. Pods large, very broad, decidedly constricted, dark green, much splashed with red. Seeds large, broad oval, fairly plump, white, streaked with pink and attractive in green shell stage — light fawn when ripe, irregularly streaked and spotted with dark red and with brown eye-ring.

Erfurt Ruby. Refs. 45, 63. This bean, with seed peculiarly shouldered, was grown at Geneva and at the Kansas Station in 1889 and listed by both Gregory and Thorburn in 1890. It is of German origin, probably very shortly before the dates given. It is of interest mainly as a curiosity because of the dark carmine red color of the young pods, which color is coordinated with similar shading of stems, branches, and leaves and deepening of the color on the outer parts of the flowers. The pods lose the color in ripening, becoming almost white.

Plant low, slender runners; leaflets small, dark green, deeply wrinkled. Pods 6 to 8 inches long, $\frac{3}{4}$ inch wide, usually irregularly curved. Seeds 4 to 6, more than $\frac{1}{2}$ inch long, nearly two-thirds as wide, broad kidney-shaped, with unequal ends, fairly plump, light greenish brown or brownish pink, veined deeper, with dark brown eye-ring.

Harlequin. Ferry introduced Harlequin in 1913 without stating the origin. It is not the French variety with similar name. As grown at Geneva it proved to be a fine type of Horticultural pole bean, improved in earliness and productivity over London Horticultural, with longer and plumper pods.

Plants vigorous, above medium height for type; foliage light colored, large; pods of Rust-proof Intermediate Horticultural type, $5\frac{1}{2}$ to $6\frac{1}{4}$ inches long, straight, with rounded ends and rather long, curved rigid tips, about $\frac{3}{4}$ inch long, very broad oval in cross-section, with flat dorsum and obtusely-pointed ventrum, smooth, well filled by the beans, only slightly constricted, rather tough, stringy, coarse-textured, not suitable for snaps, medium, green marked, purplish carmine, attractive but not showing yellow for contrast. Seeds large, sometimes $\frac{1}{2}$ inch long, broad ovate or almost oblong, very plump, with rounded, not truncate ends, typical Horticultural markings but darker in shade than most of group.

Horticultural Lima. Refs. 85. Syn. Giant Horticultural. This variety is an anomaly among beans, and showed certain characters that led to the name and gave support to the belief that the variety came from an accidental, or field cross, between Dreer Improved Pole Lima (Challenger) and Horticultural Pole (Speckled Cranberry) or Dwarf Horticultural which stood near each other on the place of J. H. (Alex J.-Tracy) Hodges, Pepton, Addison Co., Vt. In 1885, Mr. Hodges found a pod of six beans, from which Horticultural Lima resulted. He grew it two years, and placed most of the stock in the hands of O. H. Alexander, of Charlotte, Vt. The latter sold the variety to Childs, who introduced it in 1891. Ferry listed it in 1893 and after two years tests commended it highly, as did Gregory in 1894. It was said to be as early as Dwarf Horticultural and to yield good crops of fine quality green-shell beans. Gregory could not recognize any of the lima flavor with which others credited it. It was listed by 20 seedsmen in 1901.

The possibility of a cross between beans of the two species *Phaseolus vulgaris* and *P. lunatis* is denied by botanists and plant breeders, all evidence is lacking in the case of Gregory's Curious Pole, and nothing definite supports Burbank's claim of a similar cross. We are forced to conclude that certain peculiarities, possibly due to "sporting" of one of the horticultural varieties, or to a cross between tall and dwarf varieties in that group, misled Hodges and others into believing that a cross had taken place with Challenger as the male parent. Somewhat similar beans have arisen from inter-varietal crosses between tall horticultural varieties with seeds approaching globular and other varieties, like Boston Favorite (Goddard) and Crimson Beauty, which have seeds similarly marked, but long, kidney-shaped, or oblong.

Plants of Horticultural Lima were rather small for pole type, not much branched, moderately vigorous; leaflets large, coarse, wrinkled like those of Dwarf Horticultural; flowers starting near ground, of medium size, white. Pods in clusters, 4 to 6 inches long, almost straight (gently curved in Gregory's figure), with long-rounded ends and short, curved, almost central tips, flat type but quite plump, swollen over beans and constricted between them, dark green, occasionally marked purple. Seeds 3 to 6, about shape and size of Dreer Lima (Ferry), shape between kidney and lima (Mich. Sta.), that is, very broad oval with straight eye-line, about $\frac{1}{2}$ inch long, three-fourths as wide, quite plump, marked like Dwarf Horticultural, but ground color slightly darker.

Italian Pole. Breck of Boston listed this variety for several years. Seed has been grown at Geneva for three years; and while it is of a horticultural type, it is not the same as any of old familiar "Horts." During the last five years there have been several new "Italian" beans offered. The description offered is taken from Breck's Italian Pole. The Italian bean of California is a strain of Speckled Cranberry or London Horticultural.

Plant climbing well, $4\frac{1}{2}$ feet or more with spread of 2 feet at base; foliage abundant, dark green, leaflets somewhat crumpled, slightly rough, medium veined, medium thick. Flowers phlox pink.

Pods much like those of Lazy Wife, $4\frac{1}{2}$ to 5 inches, broad, straight to slightly curved, quite plump, brittle, stringless, almost fiberless, with fairly thick walls, medium in texture and of more than fair quality; light green in color, "silky" or silvered, not so spotted

or splashed with red as American types; but developing rather late a marked rustlike bright carmine color which gives a pleasing appearance. Seeds are nearly as large as those of Worcester and attractively marked either green or dry. Color a dark background with broad zebra markings, one usually over dorsum, that are of a bronzy or greenish brown color which darkens to seal brown without red.

King Horticultural. Refs. 48, 91. Syns. Hampden, Mammoth Podded Horticultural, Mug Wump, New Zealand Runner Kidney Bean, Worcester. This bean was grown by a market gardener near Worcester, Mass., for several years and was introduced in 1894 and 1895 by several seedsmen under different names. Of these, Gregory's Mammoth Carmine Podded Horticultural has apparent priority, but owing to its length and its similarity to names of other pole and dwarf varieties, the name Worcester, used by W. W. Rawson, and based on the place of origin, was favored for many years. The name King Horticultural has become more popular in recent years and is used in New York State. It is a late variety, only fairly productive but not especially subject to disease. It has increased in popularity since 1906, but at present is little grown except in eastern Massachusetts and New York.

This is the largest-podded and largest-seeded of the Horticultural beans, and most attractively colored and most showy in pod. It is most like Early Horticultural, but with longer pods, reaching 6 or sometimes 7 inches, much swollen over the seeds, which are often 7 in number, $\frac{2}{3}$ inch long, nearly three-fourths as wide and about two-thirds as thick, colored like those of London Horticultural, about 40 to the ounce.

London Horticultural. Refs. 10, 12, 13, 15, 20, 43, 44, 48, 52, 59, 63, 67, 68, 77, 91, 97, 98. Syns. Arancauo, Bird-Egg Bean, Cherry Pole, Horticultural Cranberry Pole, Housewives Delight, Moro, Scipio Pole, Speckled Cranberry, Wrens Egg. This variety, under some of its names, is probably our earliest horticultural type bean. Hendry of the California Station says it is evidently the Arancano of Chile. If this is the case, the bean undoubtedly came into the East in trading vessels and probably went to Europe in the same way, where it became known to Savi and later to Martens. It was certainly known before 1860 in the United States, the earliest date given by Tracy and Jarvis. Burr says it came to America from England about 1825. It is undoubtedly the most popular, and probably the best of the tall horticulturals. The use of the name Horticultural Pole and other synonyms for varieties other than London Horticultural make it impossible to fix the exact range of popularity.

It was grown at this Station in 1882 as Horticultural (London Horticultural) and as Cranberry, which Wing considered identical, though data show the latter decidedly earlier and less productive. In recent tests London Horticultural, Horticultural Pole, and Horticultural or Cranberry from different sources were included. These showed varietal similarity, with slight strain differences mainly in size of seeds. Those of Horticultural Pole were largest, approaching those of Worcester, but the shortness of the pods excluded it from that variety. Season, about 80 days for the shell beans. A new strain called Improved London Horticultural is about



YARD LONG OR CUBAN
ASPARAGUS



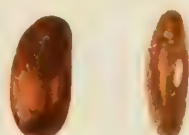
GEORGIA POLE



SOUTHERN PROLIFIC



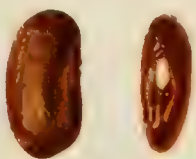
BURPEE'S STRINGLESS
GREEN POD



KENTUCKY WONDER
WAX



CLIMBING FRENCH
CARTER'S RESELECTED



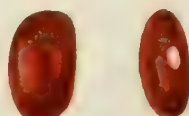
GOLDEN HARVEST
CLUSTER WAX



WELL'S RED KIDNEY



HIDATSA RED



MEXICAN RED



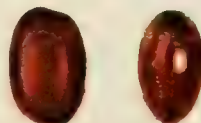
TENDER POD



PLENTIFUL



ABUNDANCE



LOW'S CHAMPION



CANADIAN WONDER



SCARLET FLAGEOLET
WAX



VIOLET FLAGEOLET
WAX



WARREN



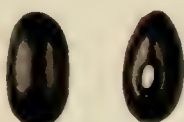
EARLY HARVEST WAX



SURE CROP
STRINGLESS WAX



ADMIRAL TOGO



EARLIEST OF ALL WAX



YOSEMITE MAMMOTH
WAX



BURPEE'S SADDLE
BACK WAX



CELESTIAL BUSH WAX



CURRIE'S RUSTPROOF
BLACK WAX



GIANT STRINGLESS WAX



PROLIFIC BLACK WAX
BUSH



PENCIL POD BLACK
WAX



PROLIFIC OR IMPROVED
BLACK WAX



GREEN PODDED
FORCING



GERMAN BLACK WAX



IMPROVED BLACK WAX
BUSH



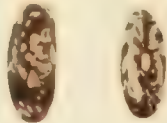
BLACK VALENTINE



BLACK TURTLE SOUP



REFUGEE (1000-1)



EXTRA EARLY REFUGEE
WAX



VALENTINE WAX BUSH



MONT D'OR



EXCELSIOR REFUGEE



HARDY WAX



KEENEY'S STRINGLESS
GREEN REFUGEE



EARLY MOHAWK



TENDERGREEN NEW
STRINGLESS



EARLY MOHAWK SIX
WEEKS



MISSOURI WONDER POLE



TENNESSEE WONDER



SCOTIA



HODSON WAX



FULL MEASURE



OREGON GIANT



GRAY SEEDED KENTUCKY
WONDER



CUT SHORT OR
CORNHILL



NANCY DAVIS CORNFIELD



MEXICAN PINTO



ITALIAN POLE



CARMINE
(Old seed)



BOSTON FAVORITE



CRIMSON BEAUTY



WORCESTER POLE



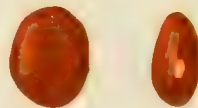
RUBY HORTICULTURAL



TEWKSBURY DWARF
HORTICULTURAL



HORTICULTURAL BUSH



GOLDEN CARMINE
HORTICULTURAL



HOPKINS RED VALENTINE



PINTO



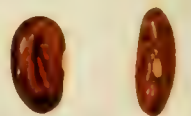
GOLDEN AGE NEW
STRINGLESS WAX



LONGFELLOW STRINGLESS
GREEN POD



EMPEROR OF RUSSIA



BALDWIN WONDER
WAX

(Five-sixths natural size)

TYPES OF BEAN SEEDS

5 days earlier than the older type and produces pods which are narrower and average one inch longer.

Plant large grower, vigorous, branches wholly green; foliage abundant, dark green, leaflets medium in size, long pointed, flat, smooth surface. Flowers pink.

Pods dark green when in snap stage, but turn yellowish green splashed with purplish to carmine red in green shell stage. Quality fair; stringless, nearly fiberless but not very fleshy. Size moderately long, very broad and rather slender ($6-7 \times \frac{5}{8}-\frac{3}{4} \times \frac{3}{8}-\frac{1}{2}$), containing 5-7 seeds per pod. Shape flat, oval in cross-section, straight to slightly creasebacked, straight to slightly curved, constricted, crowded, smooth, filled to the tip and edge and truncate on the end. Spur long, slender and curved to assume a perpendicular to the pod. Suture, placental is flat to slightly indented and carpellary, acute to moderately obtuse.

Seeds large, $1.5 \times 1.0 \times .85$ cm. (50-60 per oz.); very broad oval, exceedingly plump, broad oval in cross-section; ends uniformly but abruptly rounded. Hilum medium, flat to slightly protuberant. Color light buff (pale pinkish buff to capucine buff) under color, sparingly splashed and streaked with dark red (ox-blood red) over entire surface and marked with a moderately wide, deep orange (zinc orange) eye-ring.

Mottled Cranberry. Refs. 3, 97, 98. This old variety, known to Martens in 1860, was also described by Burr in 1863 and was undoubtedly known in both Germany and America before these dates. The strikingly colored beans, half red and half white, command attention for the variety. It has been quite widely distributed under various names but has too few advantages to displace established kinds.

Plant rather low, poor-climbing, leaflets broadly ovate, almost triangular, rather short-pointed. Flowers white. Pods short, 4 to 5 inches long, broad, slightly flattened, tender and edible in early stages; but soon stringy and fibrous. Seeds about 4, about $\frac{1}{2}$ inch long, decidedly more than half as wide, very plump, very broad oblong laterally, and oval or ovate on edge view, half about eye and toward one end dark crimson, remainder of bean white, more or less striped and spotted with red, the amount and distribution of white and colored portions varying considerably.

Red Cranberry Pole. Refs. 12, 13, 48, 63, 91, 97, 98. Syns. Arlington Red Cranberry, Boston Market Pole, Cardinal, Horticultural Pole, Medium Imperial, Pearl. This is one of the oldest American varieties. It was listed by Thorburn in 1822 and was possibly one of the beans planted before 1612 by the Indians of Maine among their corn, as mentioned by Leocarbot.¹ Josselyn² includes red beans among the many grown in America before 1670. Growth among the corn would indicate climbing types, and Red Cranberry Pole was such a bean, suitable for growth in the North. This bean was described by Burr as one of the most widely cultivated and most useful beans in this country; but as grown at this Station in 1882 and 1883 it was inferior, both in earliness and productivity, to many other pole beans.

Boston Market Pole Cranberry was considered identical with Red Cranberry in early tests at this Station, which opinion others have followed. A study of numerical data given show that Boston Market, in both years tested, was two weeks earlier for green shell beans and very much more productive. Arlington Red Cranberry, introduced about 1885, probably by Farqu-

har, was a selection from Red Cranberry and differed from it in wider, flatter, longer-pointed, and stringless pods.

Plants slow in starting, but later climbing well, large, heavy-stemmed, much branched; foliage moderately abundant, leaflets large, broad-obovate, almost triangular, taper-pointed, slightly crumpled, smooth-surfaced. Flowers pink. Pods uniform, 5 inches long or more, almost straight, with short-rounded ends and short, central tips, flat but soon swollen by beans, smooth-surfaced, brittle, soon somewhat stringy, broad, almost fiberless, green with purplish shading, on sutures. Seeds 7 or 8, crowded in pod, short, very broad oval, fairly plump, with a short-rounded end, rarely truncate, very dark red or brownish crimson.

DWARF VARIETIES

Boston Favorite. Refs. 48, 59, 80, 91, 96. Syns. Breck's Dwarf Horticultural, Goddard, Godding Dwarf, Red Podded Dwarf Horticultural. Boston Favorite, perhaps better known as Goddard, was grown about Boston for some time before 1885, when it was introduced by the Aaron Low Seed Company and by Rawson under the name given by Gregory, as Red-podded Dwarf Horticultural, and probably by others. It soon became very popular, and is still sold by many seedsmen in the East. Although rather late, it picks over a long season and is very productive. The spreading, runner-forming habit of the plants and the too frequent production of short pods is corrected in strains known as Improved Goddard (Ferry, 1897) and Crimson Beauty.

Plant a very large, spreading bush, open, rather sprawling, with some runners; leaflets small, dark green. Flowers bluish pink. Pods 5 to $6\frac{1}{2}$ inches long, 5 to 6 seeded, abundantly splashed with red, smooth, broad, flat, cross-section ovate-acuminate, straight, regular, end with tip, spur short, slender, rigid centered. Seed large, long, oval, flat, ends rounded, streaked or patterned rather than speckled with crimson.

Crimson Beauty. Refs. 48, 91. Ford announced Crimson Beauty for trial in 1895 and distributed it regularly the next year. According to Tracy, Ford credits origination of the variety to E. D. Gibson, Ashburnham, Mass., as a cross between Boston Favorite and a wax-podded bean.

Plant habits those of Improved Goddard, otherwise very similar to Boston Favorite with green-shell pods (later yellow) more extensively marked crimson, straighter and more slender; beans smaller and rather more plump.

Dwarf Horticultural. Refs. 10, 13, 15, 28, 29, 35, 36, 41, 47, 48, 59, 77, 80, 85, 87, 91, 96. Syns. Carmine Podded Horticultural, Dwarf Wrens Egg, Early Carmine Podded, Intermediate Horticultural, Ruby Horticultural, Speckled Cranberry Bush. Under various names, of which Dwarf Cranberry or Dwarf Speckled Cranberry were probably earliest in America, this bean has a long history extending over 150 years in Europe and over a century in the United States. It is credited by some to Italy, where beans of this type, both dwarf and pole, are very popular. From all available descriptions, Mawe's Spotted Amber, or Sparrow's Egg, Speckled Cranberry, Dwarf Horticultural, and Ruby Horticultural had or have seeds of typical horticultural shape and color, short-ovate, slightly flattened sidewise,

¹ Leocarbot *His. Nouv. France*. 835. 1612.

² Josselyn *J. Voy.* 59. 1865.

with pinkish-flesh background shaded buff, with spots, dashes, and curved streaks or bands, usually interrupted, of dark purplish crimson, base color darkening with age to light, then dark brown, and markings to purplish maroon, then dark maroon. Seeds of Burr's Dwarf Horticultural, the newer type, were one-sixth larger than those of Dwarf Cranberry; and the better strains of Ruby Horticultural are about as much larger than those of the old Dwarf Horticultural, averaging now about 50 to the ounce. Dwarf Horticultural is an early strain, 60 days for shell beans, about 10 days earlier than French Horticultural, the pods are also less highly colored and shorter.

Pods borne both above and below foliage; color light green in snap stage, changing to white and splashed with carmine in the green shell stage. Quality fair; rather tough, stringless, little or no fiber, but rather coarse in texture. Size medium long, broad, and quite plump ($5-5\frac{1}{2} \times \frac{5}{8}-\frac{3}{4} \times \frac{3}{8}-\frac{7}{16}$ inches), containing 4-6 seeds per pod. Shape flattened, ovate in cross-section, nearly straight but occasionally slightly curved, straight backed, regular, crowded, smooth, filled to the tip and edge, and rounded at the end. Spur short, thick and straight. Suture, placental is slightly indented and carpellary, acute.

Seeds medium to large, $1.35 \times .9 \times .7$ cm. (60-65 per oz.); oval to short-oblong, plump; very abruptly rounded ends, occasionally truncate. Hilum medium, flat. Color deep buff (pinkish buff) which later changes to light brown, streaked and spotted irregularly over the entire surface with very dark red (ox-blood red to maroon); narrow, medium brown eye-ring.

Firebrand. The origin of this variety is unknown. It was offered by Schell as a wonderful new bean deriving its name from its color. It could well be a development of Improved Goddard or Crimson Beauty crossed with a wax-podded variety.

Plant large, foliage abundant, leaflets rounder than those of Crimson Beauty, more crumpled, heavy veined, thick. Flowers phlox pink.

Pod yellow, faint streaks appear early on the long pods, later beautifully marked carmine; they are fleshy, practically stringless; and contain seeds which are very large, often $\frac{3}{4}$ inch or more long, broad, flattened, curved kidney-shape, with longitudinal, curved "zebra" markings raying out from the eye, and frequently with one band extending over dorsum, or crest, of bean.

French Horticultural. This is a rather distinct selection from Dwarf Horticultural which has gradually replaced other similar varieties. The pods are larger, 6 to 7 inches long, flat, round at green shell stage, straight to slightly curved, dark green color turning greenish yellow and heavily splashed or speckled with bright red. The plants have a tendency to throw out short runners, but it is not a true climber. The strain grown at Geneva produced plants and pods very similar to Tewksbury Dwarf Horticultural, a popular sort in Massachusetts.

Marblehead Horticultural. Refs. 16, 36, 48, 61, 87, 91. This variety was introduced in 1882, after a year's trial by Gregory, who said its origin was unknown, but later credited to a Mr. Dodge, Beverly, Mass.

Plant similar to Ruby Horticultural, earlier if anything; taller, more open, more erect, runnerless; pods not as wide, darker in color, marked purplish, very fibrous; seeds often truncate at end and with brown rather than reddish markings.

Pottawottomie. Refs. 13. The name evidently refers to an Indian bean described by Burr. The beans

were well flavored, equal to horticulturals for green shell beans, and very late.

Plant very strong and vigorous, with large, luxuriant foliage and flesh white flowers. Pods and seeds apparently very similar to those of Goddard, former 6 inches long, green, then mottled and streaked lively rose red on cream, the markings becoming purplish at maturity, very tough and stringy: the seeds 5, rarely 6, light creamy pink, streaked and spotted red or reddish brown, duller and darker with age, reaching cinnamon brown, kidney-shaped, $\frac{3}{4}$ inch long, half as wide.

Red Speckled. Refs. 47, 93, 94. This is the fore-runner to Boston Favorite and, according to Burr (1863), had been grown in American gardens for over two centuries. In its improved form or successor, Boston Favorite or Goddard, it is still extensively grown. The original variety has been long cultivated and highly esteemed in England and France and is also well known in Germany. According to Wing, seeds from Venezuela, grown here in 1884, produced Red Speckled; so the variety may have an even longer American history. The pods were of only medium quality as snaps, but the beans green or dry were excellent. As grown here in 1883, it was quite late and only moderately productive.

Rustproof Intermediate Horticultural. Syn. Tewksbury. This variety bears several quite different names, but according to Edgar Gregory all strains came originally from one source, so we include all under the one first listed. It is said to have originated with Mr. Chandler, Tewksbury, Mass., or he at least accumulated stock of it for sale. The name French, or Tewksbury, is quite intimately associated with one group of synonyms which may have been the name of an earlier grower. Mr. Gregory considered it the best of the numerous Dwarf Horticulturals, but until lately it has not been as popular as the Ruby strain. It is very productive, but late and useful mainly for green-shell beans.

Plant tall, $1\frac{1}{2}$ ft., erect, but with many short runners; foliage medium green, rough with large leaflets broad at base and tapering evenly to sharp point (Tewksbury has leaflets duller, darker green, decidedly smaller, more noticeably pointed), flowers white, cream or blushed, according to age and strain, those of Tewksbury lighter; pods long, $6\frac{1}{4}$ to 7 inches, or more, straight, more pointed than rounded at ends, with long, slender, straight tips, beautifully marked with carmine and very attractive, but soon rather stringy and tough; seeds larger than any except best strains of Ruby, inclined to curve more on dorsum, making them appear broader, with markings more in patches, occasionally large, than in bands and dashes.

THE FIELD BEANS

Field beans (edible dry beans) belong botanically with the varieties mentioned in preceding sections, viz., pole garden beans, dwarf garden beans, and horticultural shell beans. It can rightly be said that the group of varieties represented here are the principal beans of commerce. They are the varieties producing the dry edible bean, a basic food found in the markets of cities on every continent. There are 55 varieties mentioned in this section and it might be assumed, since dry beans are grown over so wide a territory and since their value measured in monetary terms is so great, that the number of varieties to be described would be much greater. Hardenburg (*Bean Culture*,



PERRY MARROW

(Natural size)



CARPENTERIA POLE
LIMA

KING OF THE GARDEN
POLE LIMA

IDEAL POLE LIMA

BURPEE'S GIANT PODDED
POLE LIMA

SMALL WHITE POLE LIMA

EXTRA EARLY SMALL BUSH
LIMA

DWARF SIEVA LIMA

IMPROVED HENDERSON
BUSH LIMA

BURPEE'S BUSH LIMA

FORDHOOK BUSH LIMA

SUPERBA BUSH LIMA

DREER'S POLE

AZTEC OR MEXICAN LIMA

SUNNYBROOK POLE LIMA

EARLY LEVIATHAN POLE
LIMA

WHITE DUTCH RUNNER

WILLOW LEAF POLE LIMA

JACKSON WONDER BUSH
LIMA

FLORIDA BUTTER POLE

BUTTERFLY

BROAD WINDSOR

FAVA

BROAD MAGAZAN

SCARLET RUNNER

MacMillan Company) says, "The number (of varieties) which is well known to the trade probably does not exceed fifty."

Because field beans have been grown for centuries it would seem as though the varieties or types had been rather well tried out and that a selective process continued for so long would leave only perfect varieties for the farmer of today. However, changes in varieties and strains of field beans are in evidence today just as in other types of beans. A variety to continue in existence over any length of time must measure up to certain requirements. In field beans these requirements are rather exacting. They may be stated as dwarfness; disease resistance; hardness; development of a large, deep root system; erectness of plant to hold pods off the ground; and the ability to shed leaves readily in the fall, to ripen pods uniformly in a season sufficiently short to escape killing frosts, and to produce pods that are non-shattering when handled before and during the curing process. The seed must show a color such as the trade requires, resist splitting during threshing, and possess the quality necessary for its use either as a soup bean, a stewed bean, a home baked bean, or as a commercial baked bean.

The seeds of field beans are for the most part solid colored, white, red, brown, yellow, or black. There are a few exceptions, such as Yellow Eye, Soldier Bean, China Red Eye, and Jacobs Cattle. The white-seeded varieties are preferred in the northern regions or where rainfall is abundant during the fall or curing season. The colored or mottled types prevail in the more temperate or dry land regions. On the markets the white-seeded varieties of this group are divided into pea, medium, marrow, and kidney beans. This classification is based on size and shape of the seeds. Other varieties which are grown in large quantities are quoted according to the variety name, as Red Kidney and Yellow Eye.

Arikara Yellow. Long before the white man visited North Dakota the Mandan, Hidatsa, and Arikara Indians had a highly developed type of agriculture along the Missouri River. Beans, corn, and squash formed the foundation of their food crops and were grown in abundance, carefully nurtured during the short dry summers and dried and stored for use in winter. Oscar H. Will came to North Dakota in 1881 where he devoted himself to the improvement of horticulture and agriculture in the Northwest. He began his seed business in 1882 and from the start saw the need to search out varieties that were suitable to growing conditions in the new country. Two varieties of beans had proved their value to the Indians. These were first listed in an early catalog of Will's as Yellow Indian and Red Indian. Later they were named Arikara and Hidatsa, after two of the leading Indian tribes of the Ft. Berthold region.

Arikara is exceedingly like Marten's *oblongus lutens*, is hardy, drought resistant, and an excellent baking bean. The pods are much like those of Burbank Navy but larger; also somewhat like pods of White

Marrow, but slightly narrower, less constricted, and with margin not wavy.

Plant dwarf, 18 inches tall, very erect and narrow with side-wheelers (runners). Foliage very scanty, medium green; leaf surface crumpled, rough, heavy veined and thick. Flowers white to cream.

Pods borne mostly below foliage; also to some extent in the lower leaf axils of runners; light brownish yellow in color. Quality poor; tough, stringy, fibrous and coarse in texture. Size medium short, quite broad and rather slender ($4\frac{1}{2} \times \frac{1}{2} \times \frac{3}{8}$ in.), containing 4-5 seeds per pod. Shape flat, oval in cross-section, moderately curved, slightly creasebacked, placental surface somewhat constricted, not crowded, moderately smooth, filled to the tip and edge, and rounded at the end. Spur short, slender and curved. Suture, placental is slightly indented and carpellary, moderately acute.

Seeds medium, $1.4 \times .75 \times .45$ cm. (75 per oz.), medium short, broad reniform, long oval thru cross-section, rather flattened; ends rounded to occasionally truncate. Hilum medium, flat to slightly indented. Color golden brown (yellow ochre to ochraceous-tawny) over the entire surface and marked with a darker vein-like under pattern; narrow, reddish-brown eye-ring present in all instances.

Aroostook. Refs. 48, 84, 85, 89, 91. Geo. W. P. Jerrard introduced this variety in 1885. In the trials at Geneva in 1885 and 1891 it was found to be early with good yield. In many ways plant and pods resemble those of Yellow Six Weeks, but with darker foliage, smaller pods, and whiter seeds.

Plant of medium size, generally without runners, erect; stocky, with rather heavy green stems; leaflets of medium size, medium green, roughened. Flowers white. Pods $5\frac{1}{2}$ inches long, rather slender, light green, flat, slightly curved, moderately constricted, with long curved tip. Seeds usually 6, small, oblong, truncate, or rounded at ends, white.

Australian Tree. Samuel Wilson Seed Company of Mechanicsville, Pa., offered this variety in 1894. The seeds were white and intermediate in size and shape between Prolific Tree and White Marrowfat, also resembling in shape seed of Boston Goddard.

Bayo. Refs. 31, 43, 44. This bean, mostly grown in the Sacramento River of California and the Southwest, is unknown in the East, but was grown in our tests and might be useful in breeding work because of the long pods crowded with many seeds. The plant, however, is rather viny and late but vigorous and very productive. Bayo came to California from Chile in the first trading vessels previous to 1850, and has been a market staple since 1853 in mining camps and for Mexican trade in Texas, Arizona, New Mexico, and Mexico. It is a baking bean, the dry seeds being nearly as large as Boston Marrow, but flattened like Lady Washington; in color lilac white to pale salmon flesh when fresh, changing with age to dark salmon pink, with a medium wide, distinct, brown or reddish chocolate eye-ring. The word bayo is a Spanish descriptive adjective and refers to the bay or chestnut color of the seed.

Bayo Chico is a smaller seeded strain, also from Chile, formerly grown in California. Imported or Manchurian Bayo is a speckled bean from the Orient, not grown in California under that name; but may be the Pinto of Aggeler and Musser, which is said to have come from Siberia and which differs from the Mexican Spotted Red or Pinto commonly grown.

Blue Pod. Refs. 13, 43, 44, 48, 91. The Blue Pod of the East is an old pea bean, described by Burr in 1863 as the earliest, most prolific field bean grown. In New York its production is mostly in the drier wheat-growing districts of western New York. A similar variety originated independently 40 years later in California in 1902, being developed from a plant growing in Small White found by Pasqual Scolari in the Lompoc Valley. Mr. Scolari retained the stock for himself for five years, but after 1907 seed was distributed by the Southern Pacific Milling Company. It was favorably received by growers and has continued to gain in favor, especially in Santa Barbara County. Small White is a California strain of the Navy or pea bean. Occasional plants bearing blue pods identical with the Blue-Pod variety are found in fields where Small White are growing. The California Blue Pod apparently is a more dwarfed and open-growing variety than the older or Eastern strain. The pods ripen a week earlier than White Marrow or Pea Beans.

Plant, semi-dwarf to dwarf, deep green foliage, white flowers. Pods five inches long, pale green when young, light yellow later with peculiar purplish tinting. Seeds 5 to 6, often squarely or angularly compressed, white. Interchangeable with Small White.

Bonnemain. Refs. 28. This variety was named for the originator, M. Bonnemain, Secretary of the Etampes Horticultural Society. Although listed in the United States about 1889, records as to its growth do not seem to be available. It was very much like White Kidney but with shorter, narrower, almost cylindrical pods, and smaller beans.

Brown Swedish. Refs. 43, 89, 91. Syn. Swedish. Immigrants from Sweden settling in the upper Mississippi Valley are supposed to have brought with them this variety which still persists as a favorite in sections of northern Michigan, Wisconsin, and Minnesota. The first recognized use by seedsmen seems to have been by Northrup, King & Co. about 1890, although the produce trade had been familiar with it for some time.

Plants of two types, one producing round pods and having a plant which is erect without runners, thick stemmed, green throughout. The plants of the second type producing flat pods, are larger in vine and inclined to spread out and send out runner-like branches. Whether these represent two distinct strains or whether the variation is an inherent character was not evident in our limited trials. Flowers pink.

Pods borne both above and below the foliage, very light green in color; quality poor; tough, very stringy and fibrous and rather coarse in texture. Size medium short, narrow and plump ($4\frac{1}{2} \times \frac{7}{16} \times \frac{3}{8}$ inches), containing 4-5 seeds per pod. Shape round; oval in cross-section, slightly curved, moderately saddle backed slightly constricted, fairly crowded, smooth, filled to the tip and edge and rounded to somewhat truncate on the end. Spur long, slender and recurved. Suture, placental is slightly rounded and carpellary obtuse.

Seeds small to medium, $1.1 \times .6 \times .5$ cm. (95-100 per oz.), oblong-oval, plump; ends rounded to truncate. Hilum medium flat. Color light brown (ochraceous-tawny) over entire surface; marked with distinct darker brown, narrow eye-ring.

There is also a so-called flat podded type that is larger in vine and which has numerous side wheelers. The flat-podded type has seeds and pods much larger and flatter than the round podded type which is described above. The smaller, erect type seems to be considered the true Brown Swedish.

Burlingame. Refs. 41, 43, 48, 84, 85. Syns. Burlingame Medium, White Medium, White Field, York State Medium. This once popular bean of western New York originated about 1896 in Genesee County, probably with D. G. Burlingame, as a selection from White Medium. The latter was grown here in 1884, and Burlingame was included in our recent tests.

In both our tests plants of these two strains were hardly distinguishable from those of Navy Pea, quite viny. Pods particularly of Burlingame, decidedly short, broad, with a tendency to curve slightly thruout and quite abruptly near tip. Seeds rather smaller than Navy, and more elongated, pearly white.

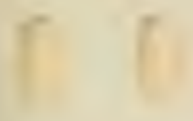
Canada Yellow. Refs. 13, 47, 56, 93, 94. Syns. Round American Kidney. Canada Yellow, known for nearly a hundred years, was very similar to China Yellow, which was reproduced in Sulphur, and was of the same utility. It was a midseason bean, maturing much faster if sown late; quite productive.

Pods 5 inches, straight, green when young, yellow at maturity, foliage more ample, less tufted, moderately crumpled, deeper green. Flowers lilac. Seeds larger, ovate to sub-cylindrical, rather than short-ovate approaching spherical, deeper colored with a shade of drab changing to nankeen-yellow (Burr) (Irish says with prominent brownish markings), and with a reddish brown line around the hilum.

Canadian Wonder. Refs. 10, 15, 16, 33, 41, 47, 48, 61, 63, 66, 80, 81, 91, 97, 98. Syns. Red Canada, Rose, Summer's Canadian Wonder. The history of Canadian Wonder is uncertain; but it is undoubtedly of Canadian origin, some time previous to 1873, when mention of it was made in an English periodical. Gregory listed the Rose Bean in 1882, seed of which was secured and grown at Geneva. Tillinghast, in 1884, carried the variety as Canadian Wonder or New Rose. In the American catalog of Carters Seeds mention is made of the great popularity of the variety in England and Carter claims to have been one of the first to make the merits of this variety known there. Its resemblance to Red Kidney would lead one to search for a clew as to a relationship but nothing has been unearthed.

So far as American uses are concerned, Canadian Wonder is chiefly used as a dry shell bean. In England, Australia, New Zealand, and to some extent on the continent the variety is grown as a snap pod or forcing bean. If picked early the pods are of good quality and when picked at that stage will be as large as most green pod varieties which have reached full size. In season late. It has a longer and more curved pod than Red Kidney and also a larger plant and is much later in season, generally appearing as a larger type of Red Kidney. It is also similar to Prolific Pickler or Gunkler (of German origin), differing slightly in the color of seed and with straighter pods. These two varieties probably produce the largest pods (thickest) of any of our dwarf bush beans.

Plant very large, 15 to 20 inches tall with spread of from 15-18 inches; erect, very upright habit of growth, compact, bushy, runnerless; extremely vigorous, very hardy, heavily productive, long in bearing; stem very stout, round, strongly ridged above; branches few, green thruout. Foliage abundant, dark green, somewhat rough surface but not wrinkled, thick; leaflets large, $5\frac{1}{4}$ inches long by $3\frac{1}{2}$ inches wide, appear as comparatively narrow, greatest width



WHITE SEEDED
REFUGEE WAX



CHINA RED EYE



SOLDIER



FARIBAULT KIDNEY WAX



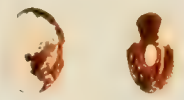
GRENELL'S RUSTPROOF
DWARF WAX



GOLDEN WAX



IMPROVED GOLDEN
WAX



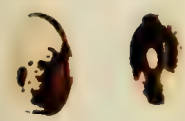
GRENELL'S IMPROVED
GOLDEN WAX



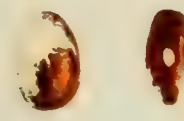
GOLDEN WAX
(old style)



FARQUHAR'S RUSTLESS
GOLDEN WAX



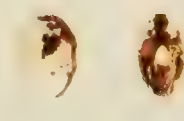
GRENELL'S IMPROVED
RUST PROOF GOLDEN
WAX



IMPROVED DWARF
GOLDEN WAX



GOLDEN RUST-PROOF
WAX



DWARF GOLDEN WAX



IMPROVED RUSTPROOF
GOLDEN WAX



GOLDEN BUTTER WAX
BUSH



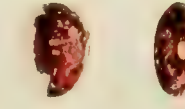
JACOB'S CATTLE



BEAUTIFUL BEAN



DETROIT WAX



KEENEY'S RUSTLESS
GOLDEN WAX



IMPROVED GOLDEN
WAX BUSH



FELTHAM PROLIFIC
STATE



WARDWELL'S KIDNEY
WAX



GREEN GEM



GOLDEN EYED WAX



WHITE WAX DWARF



FAIRFIELD WONDER
WAX



BEST YET WAX



BRITTLE WAX



ROUND POD KIDNEY
WAX



IMPROVED BUTTER WAX
BUSH



BURPEE'S NEW KIDNEY
WAX



STRINGLESS
KING OF THE WAX



STRINGLESS KIDNEY
WAX



MAGPIE

TYPES OF BEAN SEEDS

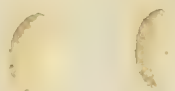
(Five-sixths natural size)



WHITE LENTIL



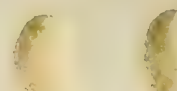
BURBANK NAVY



BOSTON WHITE
BAKING



IMPROVED ROBUST



BOSTON NAVY



BURLINGAME MEDIUM
FIELD



LARGE WHITE
MARROW



LAZY WIFE POLE



BOSTON MARROW



PERRY MARROW



NOVA SCOTIA MARROW



WHITE SEEDED
GREENPOD



BURGERS GREENPOD



McCASLAN POLE



GOLDEN CLUSTER WAX



DUTCH CASE KNIFE



GIANT SWORD POLE



CRYSTAL WHITE WAX



SOUTHERN CORNFIELD



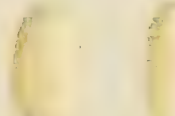
WHITE CREASE-BACK



WHITE WAX BUSH



DAVIS WAX



MARVELLOUS



FORDHOOK FAVORITE



WHITE KIDNEY
(pure line)



ROYAL WHITE KIDNEY



IMPERIAL WHITE



WONDER OF FRANCE



GREEN SEEDED DWARF
FRENCH



SULPHUR



IMPERIAL YELLOW EYE



IMPROVED YELLOW EYE



YELLOW EYE



STATE OF MAINE
IMPROVED YELLOW EYE



PINK EYE

TYPES OF BEAN SEEDS

(Five-sixths natural size)

well above base, tapering evenly to tips without marked points. Flowers lilac.

Pods borne intermediate among the foliage; poor quality, fairly tough, stringy and very fibrous—somewhat more desirable from these standpoints when extremely young. Size long, broad and medium slender (5–6 x $\frac{1}{2}$ – $\frac{5}{8}$ x $\frac{3}{8}$ inches), containing 5–6 seeds per pod. Shape flat, long, ovate thru cross-section, very slightly curved, straight backed, regular not crowded, fairly smooth, filled to the tip and edge and rounded to slightly tapering on the end. Spur long, medium slender and slightly curved. Suture, placental is flattened and carpellary, acute.

Seeds large, 1.7 x .8 x .5 cm. (45–50 per oz.); long reniform, flattened; ends usually uniformly rounded but occasionally truncate. Hilum small, flattened. Color shining dark red (ox-blood red) shading into a slightly darker tinge on the hilar surface, marked with a narrow, inconspicuous, dark, brownish-maroon eye-ring.

Chartres. Refs. 47, 93, 94, 98. Chartres appears to have been grown in America only experimentally, from French seed. Although Wing called it strictly dwarf, other authorities agree in making it trailing in habit, with many runners from 2 to 4 feet long, which, however, cling poorly to poles. Therefore, it is nearly always grown as a field bean. The green pods could be eaten very early as snaps, but its principal use was for dry shelling. In our tests it was rather later than White Marrow, and unproductive.

Pods $3\frac{1}{2}$ to $4\frac{1}{2}$ inches long, just under to just over $\frac{1}{2}$ inch wide, curved with a slender, straight tip. Seeds same in length as pods, $\frac{1}{4}$ inch or more in width, and more than half as thick, with truncate ends making an almost rectangular rather flat bean about the size of Boston Marrow, deep wine red in color, with almost black eye-ring.

China Red Eye. Refs. 9, 13, 15, 27, 29, 41, 45, 47, 48, 49, 59, 63, 80, 91, 96. Syns. China, Chinese Date, Early China, Early China Red Eye, Red Eye, Two Colored China Dwarf. This old variety, grown in America for at least a century and a quarter, is of unknown origin. French and German authorities say it came from America, Jarvis believed it of European origin, and the name together with Savi's reference indicate a Chinese source. It was once very widely grown, at first as a garden bean and later for field culture. It is now grown only sparingly as a field bean, being of too poor quality for snaps or green shell purposes and will undoubtedly soon disappear. More than 40 American seedsmen listed it in 1907, but only 4 in 1921.

Plant dwarf, erect, compact, runnerless, hardy, productive, and moderately early; with leaflets medium to large, broad, short-taperpointed tips, dark to medium green, thin, crumpled. Flowers white. Pods long ($4\frac{3}{4}$ – $5\frac{1}{8}$ inches), rather slender, oval, usually straight, constricted, with very long, slender tips, whitish green changing to light yellow before maturing.

Seeds intermediate in size between pea and marrow beans, about 10 to the ounce, oblong with unequal, abruptly rounded ends, nearly circular in cross-sections, sides almost straight but gently tapering between large and small ends, white with oval or irregular margin, sometimes nearly "butterfly-shaped" pinkish red to dark red area about hilum, often extending as broad line partly over smaller end of bean; not over one-fourth or one-third area, tho formerly said to cover nearly half surface.

Chilean Field. Refs. 13, 48, 91. This bean is evidently a strain of the Chilean variety Coscarron medio, brought from Chile as Lady Washington.

Dakota Soup. Refs. 84, 85. From the only record

we find of this bean, it was grown at the Michigan Station in 1890 from seeds sent by Maule.

Plant small, compact bush, bearing small straight pods 2 to $2\frac{1}{2}$ inches long, with small, round dark yellow peas; early and moderately productive.

Day's Leafless Medium. Refs. 91. This variety was first offered by E. F. Dibble of Honeoye Falls, N. Y., in 1895, who had obtained the stock from the originator, Wm. H. Day. In general characteristics it was heavily productive, plant very spreading with many runners. Flowers white. The seeds were intermediate between the large size known as marrow and the small seeds known as pea beans. Seed indistinguishable from those of Burlingame, both selling as York State Medium.

Dwarf Rice. Refs. 13, 47, 56, 93, 94. This old German variety with very small seeds was known to Burr in 1863, to Irish in 1901, and was grown at this Station under its German synonym in 1884.

Plant semi-dwarf, 2 feet tall, with light green, "varnished" foliage and white flowers. Pods very small, 3 inches long by $\frac{2}{5}$ -inch wide containing 6 very small seeds, noticeably rice-like in appearance and quite irregular in shape, sometimes oblong or ovoid, often abruptly shortened $\frac{3}{8}$ inch long by $\frac{1}{4}$ inch wide. The young pods were quite tender, ready as snaps in about 10 weeks. The dry seeds were rather like rice in consistency, with a peculiar brittle texture liked by some, not by others.

Extra Early Six Weeks. This bean, often known as Drop Leaf, was grown in the East for some years before 1892. It was said to be more productive than Navy Pea, much earlier, and entirely rust-proof.

Plants 1 to $1\frac{1}{4}$ feet tall, compact; pods 5 to 6 inches long, $\frac{1}{2}$ inch wide, slender, straight or slightly curved, green; seeds 4 to 6, slightly oblong, inclining to kidney-shape, rather flat, slightly larger than those of Navy, white with rich brown eye-ring.

French White. Refs. 48, 91. Peter Delphy, a grower at Vista, Calif., secured seed of this strain from France in 1902. It was later identified, presumably by the seeds alone, as the French variety Quatre-a-Quatre (Four-to-Four, from pods regularly in two-pair clusters). But as this is a pole bean, the new bean imported by Mr. Delphy seems more likely to be a strain of Nain blanc Quarantain, which is very close to our Vineless Marrow. So far as known, French White is grown only in California, where the beans are marketed with those of Lady Washington, although the seeds are more plump and with obscure grayish areas on the sides. They serve well for baking but are said to become too soft in canning.

Plants taller than those of Lady Washington, more vigorous and more erect, and the leaflets are smoother and slightly smaller; flowers appear earlier and continue longer; young pods are edible, being nearly stringless.

Great Northern. Refs. 43, 89, 91. This bean came into public notice about 1907, when Will distributed seed received from the Mandan Indians by whom it had been long grown. Seed of it has been found buried in mounds known to be centuries old. Where grown with Navy bean it has proved hardier, earlier, and more productive. Great Northern has proved to be well adapted to growth in the irrigated sections of Montana.

The seeds are similar to enlarged, rather lengthened Navy beans, or intermediate in size and shape between Navy and White

Kidney, produced in pods $3\frac{3}{4}$ to $4\frac{1}{8}$ inches long, rather narrow, regularly curved, slightly constricted, blunt ended, with short, slender, curved tip. The plants are $1\frac{1}{4}$ to $1\frac{1}{2}$ feet tall, with many slender branches and vines sometimes reaching 5 feet, forming straw which live stock readily eats.

Ground Bird. Corn, beans, and squashes were the principal vegetable foods of the Iroquois Indians of New York. Many varieties of beans have been preserved by the Indians and are still cultivated and used by them as food plants. Several of these varieties were secured from Chief Walter Kennedy of the Alleghany Reservation at Salamanca, N. Y., and have been grown at Geneva. In color of seed they are quite unlike any of the dwarf varieties now commonly grown. They proved to be hardy in growth and very productive. The origin of these types is unknown, but they were undoubtedly grown in pre-Columbian times by the Indians and perhaps found their way northward from South American countries. New York State Museum Bulletin 144, 1910, "Iroquois Uses of Maize and other Food Plants," by Arthur C. Parker, contains much interesting information on the early food plants of the region. The following sentences are quoted, "Beans next to corn were regarded as a favorite food and quantities are still eaten. The Iroquois have 10 or more varieties of beans which they claim are ancient species which have long been cultivated."

Plant dwarf, 12-14 inches tall, spread 15-18 inches, drooping, semi-trailing. Stem medium size, round near base, slightly angular on upper portion, moderately smooth, occasionally slightly ridged. Internodes short. Branches medium number, both basal and medial in position. Foliage abundant, moderately dark, glossy green; wrinkled, pubescence medium. Leaflets moderately small, broad (3×4 inches). Stipules medium, tips short, abruptly pointed. Tendrils simple, medium, slightly curled, permanent. Flowers (phlox purple) begin at 5th node, single or in pairs. Peduncle short, slender.

Pods borne intermediate and above the foliage; green (Kildare green), occasionally showing fine flecking with deep crimson and purple similar to markings on horticultural beans. Quality poor, moderately brittle, stringy, coarse and tough. Moderately short, medium width, slender ($4-5 \times \frac{9}{16} \times \frac{4}{16}-\frac{5}{16}$ inches) containing 5-6 seeds per pod. Flat, long oval in cross-section, straight, straight backed, regular, not crowded, smooth, filled to the tip and edge and rounded to blunt on the end. Spur short, slender, straight to slightly curved. Suture, placental flattened and carpellary. acute.

Seeds small, $1.1 \times .75 \times .6$ cm. (106 per oz.); shape short oval, plump, cross-section moderately broad oval, ends abruptly rounded. Hilum flat, medium. Color dull white, sparsely speckled with greenish gray (dark glaucous-gray), irregular shaped dots over the entire surface and marked with a narrow, buff (cinnamon-buff) colored eye-ring.

Hatt New. Refs. 84, 85. Jack Hatt of Argentine, Mich., selected and introduced three varieties shortly before 1890. The lot tested at Geneva produced plants and seeds exceedingly like French Flageolet.

Plants tall, growing better with support; foliage dark green; leaflets of medium size; pods flat, 4 to 6 inches long, decidedly curved; beans large, "half-round", white.

Hidatsa Red. Syn. Red Indian. The history and uses of this native bean are the same as those of Arikara Yellow, the principal difference being in the seeds, those of Hidatsa Red being a rich glossy wine red or dark

purplish crimson as compared to the yellow seeds of Arikara. Oscar Will introduced Hidatsa as Red Indian, later renaming it for one of the Mandan Indian tribes. The Red is said to be a better cropper than the Yellow, but the beans are not quite so good in flavor. The dried beans of Hidatsa Red are indistinguishable from those of Red Mexican. Both have white flowers, but plants of Hidatsa are early, practically runnerless, have small leaflets, and short pods. Red Mexican plants are late, viny, with heavier foliage, and longer pods.

Pods borne mostly below foliage; medium green in color; quality poor, stringy, fibrous, tough and coarse in texture. Size short, quite broad and plump ($3\frac{1}{2}-4 \times \frac{1}{2} \times \frac{3}{8}$ inches), containing 4-5 seeds per pod. Shape flat, oval in cross-section, straight to slightly curved, straight backed, constricted, not crowded, rather wrinkled, filled to the tip and edge and rounded to somewhat truncate at the end. Spur short, slender and recurved. Suture, placental is flattened and carpellary, moderately obtuse.

Seeds small, $1.2 \times .8 \times .5$ cm. (110-115 per oz.); very broad oval, almost rectangular, rather flattened, long oval in cross-section; ends truncate to abruptly rounded. Hilum medium, flattened to slightly indented. Color reddish purple (corinthian purple to bordeaux) over the entire surface but increasing in intensity on the hilar and dorsal surface, and marked with a very narrow, black eye-ring.

Hubbardston. The 1922 catalog of Childs first carried the description of this new bean which was said to be "earlier than Navy Pea or Yellow Eye, fine as a dry bean for baking, having a combined flavor of beans and peas." Seeds received here in 1922 were larger, shorter, and slightly darker than those of Sulphur, having a distinct brownish shade.

Indian Bean. This is another of the old Indian varieties. Plants larger than Ground Bird, but more erect and with fewer trailing branches. The seeds are large and with very individual markings. In the type of marking they resemble seed of Jacob's Cattle, but the color is darker and the size larger.

Plant dwarf, 16-18 inches tall, spread in row 12-14 inches; erect growth, intermediate between Ground Bird and Red Face in branching habit, good vigor, productive. Stem stout, round, smooth, slightly ridged above base. Internodes moderately short. Foliage medium, medium dull light green; leaf surface moderately smooth; moderately thick, medium veined. Leaflets moderately large, long, $4\frac{1}{4}-4\frac{3}{4} \times 2\frac{3}{4}-3$ inches. Tip medium, tapering. Stipules moderately large, tendrils simple, medium, little curled, and permanent. Flowers white, borne in pairs often singly.

Pods borne both intermediate among the foliage and above; moderately dull light green (Chrysolite green). Quality fair; brittle, stringless but coarse in texture. Size moderately long, broad and slender ($6-7 \times \frac{1}{2}-\frac{9}{16} \times \frac{1}{4}-\frac{5}{16}$ inches) containing 5-6 seeds per pod. Shape flat, long oval in cross-section, straight slightly creasebacked, regular, not crowded, filled to the edge but not to the tip and rounded at the end. Spur, medium long, moderately thick and straight. Suture, placental slightly indented and carpellary, acute.

Seeds large, $1.8 \times .9 \times .7$ cm. (42 per oz.); shape long, sub-reniform, cross-section long oval, somewhat flattened. Ends rounded, hilum small, flat. Color dull white, spotted and blotched on ventral surface with buff (salmon color), dull pink (etruscan red) and deep purple (indian purple), the latter color predominating. The spots also occur as disk-like markings on the dorsal surface, but on the ventral, the coloring is solid with no white showing.

Jacob's Cattle. This bean with such unusual seed color is of unknown origin and quite local distribution

in Maine, but it may be identical with the Trout bean of northwestern Massachusetts, New Hampshire, and Vermont of which we have been unable to obtain seed or direct references. The latter is probably the German bean Forellen.

Plants very dwarf, less than a foot tall, with foliage like that of China Red-eye, and very uniform pods, $4\frac{1}{2}$ to 5 inches long, slightly but regularly curved and gradually enlarging from neck to end, which is rounded with long, slender curved tip from about center. Seeds 5, very similar in shape to China Red-eye, about $1\frac{1}{6}$ larger, and very distinctly marked. More than half of the surface centering irregularly about the hilum, often more markedly on one side or one end than the other, is covered with a solid, irregularly margined blotch of brownish crimson, the remaining surface being white upon which are irregularly distributed perfectly round dots and spots of the same red. Any irregularity of margin of the spots is due to the joining of two or more.

Lady Washington. Refs. 43, 44, 48, 91. Syns. Large White, Chilean Field Pea. The native bean of Chile known as Coscarron medio was probably brought "around the Horn" at different times, since it was grown in the East before 1850 and is still found here occasionally. It was taken to California from the East about 1851, and was first listed on the markets in 1856, but it was little grown until about 1891 when fresh seed was probably brought from Chile, Southern California, or Mexico. From that time its culture spread rapidly. Its chief value is as a soup or baking bean, as it cooks soft in canning. Slightly later than pea beans, but fully as good if not better in crop, with beans flatter, slightly larger, and produced on more viny plants.

Plants $1\frac{1}{8}$ to $1\frac{3}{8}$ feet tall, with stout, erect stem like that of Prolific Tree, but with many trailing runners reaching 3 feet; foliage abundant, dark green, thin, smooth; leaflets medium to large, broad, rounded, not taper-pointed. Flowers borne very low, white. Pods paired or in clusters, $4\frac{1}{2}$ to $4\frac{3}{8}$ inches long, straight, with blunt ends and long, slender but rigid tips, nearly $\frac{1}{2}$ inch wide, oval in section, not greatly constricted; seeds about 7, very short, broad oval, rather flat, slightly lighter than those of Robust (145 to the ounce).

Mahogany Red. This uncatalogued variety, occasionally found in the markets, may be entirely distinct from Red Kidney, but its seeds are so similar in shape that it must be classed with it. The seeds are rather more slender, more markedly kidney-shaped, and much darker, approaching with age a rich mahogany red. They are inferior in quality to other Red Kidneys, especially Geneva and York, with skins of distinctly "tough" texture.

Maine. Refs. 16, 47, 49, 61. Thorburn listed this variety in 1890, but it probably was grown much earlier. In early descriptions it was said to be valuable both as a snap and baking bean.

Plant small, with few branches; leaflets yellowish green, $3\frac{1}{2}$ – $3\frac{3}{4}$ inches long, two-thirds as wide, quite smooth, thick. Flowers white. Pods very short, $2\frac{1}{2}$ to $3\frac{1}{2}$ inches wide, oval in cross-section, greatly curved, with long, slender curved tip. Seeds nearly or quite one-half inch long, sub-cylindrical or slightly kidney-shaped, usually broad at ends, often truncate, snow white, like those of Davis Wax, but smaller.

Maine Frost-proof. A field bean sent to this Station in 1885 by Hoskins, and grown one season.

Plants very dwarf, under a foot tall, prolific; pods loment-like, 4– $4\frac{1}{2}$ inches long, recurved, often bent sidewise; seeds more or less striped and spotted with gray on a white ground.

Navy Pea. Refs. 13, 34, 38, 43, 47, 56, 63, 74, 91, 96, 97, 98. Syns. Banner Leafless, Bismarck Great American Soup, Boston Pea, Boston Marrow Pea, Boston Navy, Boston Small Pea, California Branch, California White Tree, California Wonder, Coscarron Chico (Chile), Early Marrowfat Pea, Early Minnesota, Electric Tree, Hallock Tree, Haricot rond blanc commun, Imperial Prolific, Improved Prolific Tree, Improved Tree, Improved White Navy, June Bean, Little Dwarf Navy, Marrow Pea, Marrowfat Pea, Mexican Tree, Navy, Portland Fancy, Prizewinner, Prolific Tree, Round White Princess, Salzer's Tree, Small Navy, Tree, White Branching Sugar, White Pea, Wisconsin Tree.

This very old variety should probably be known as Pea-bean, which form was preferred by Burr, our earliest American authority on garden vegetables; but Navy has now become the market name of a type rather than that of a particular variety, so we follow Irish, Tracy, and Jarvis in using Navy Pea to separate part of the group from a few other pea beans that are clearly distinct, like Robust and Snowflake. The first part of the name in no way characterizes the variety but merely refers to the preference for use at sea of the American Navy for beans of this type.

Beginning with the cultivation by the Indians in New York State, the small white pea bean has been the most widely grown of the field beans. Selection for higher yields and hardier plants was commonly practiced by bean growers. Nearly 100 quite distinct names have been applied to beans of this type grown in various parts of the United States. The many synonyms of the variety, of which some have indicated rather distinct types, are now interlocked and confused so that little can be done to separate them. Of the white-seeded beans used for cooking or baking, we have the white marrows, the white kidney beans, and a third type made up of the smaller-seeded sorts and represented by Great Northern, Lady Washington, Robust, Navy Pea, Small White, and York State Medium. Navy pea is the principal field variety of the United States, requiring about 120 days between killing frosts. In addition to its universal use as a home baked bean, it is used extensively for the commercial canned baked bean.

Plant dwarf, 14 to 16 inches tall, spread in row of 16 to 18 inches; with many short runners lying loosely on the ground; very vigorous, hardy, heavily productive; rather slender stemmed, much branched, green thruout. Foliage very abundant, medium to dark green; leaf surface smooth to very slightly rough, thin; leaflets small, $2\frac{1}{2}$ to $3\frac{1}{4}$ inches long by 2 to $2\frac{1}{2}$ inches wide, widest at $\frac{1}{4}$ distance from base, lateral leaflets quite one-sided, rounded to stem, tapering to short pointed tip. Flowers white.

Pods borne mostly below foliage; also to some extent in the lower leaf axils of runners. Color very light green. Quality poor; stringy, very fibrous, tough, but possessing fine texture. Size short, narrow and slender ($3\text{--}4 \times \frac{3}{8} \times \frac{5}{16}$ inches), containing 6–7 seeds per pod. Shape flat in snap stage, but nearly round as a green shell bean, broad oval in cross-section, straight backed, slightly curved, regular, fairly crowded, smooth, filled to the tip and edge, and rounded at the end. Spurs short, medium slender, and recurved. Suture placental is flat and carpellary, somewhat obtuse.

Seeds small, .9 x .6 x .5 cm. (130 per oz.); oval, quite plump to somewhat flattened; ends abruptly rounded to truncate. Hilum

small, protuberant. Color white, thru which shows numerous gray, vein-like markings over the entire surface.

Nettle-leaved Canterbury. Refs. 47, 53, 93, 94. A variety useful in America only as a green-shell or dry-shell bean, but which in France was often forced for the young green pods.

Plant with very dark-green, almost black, much wrinkled or "puckered" foliage which distinguishes it from all but one or two other varieties.

In most characteristics similar to White Kidney, but only half as tall, with rather shorter, more curved pods, and broader, flatter beans more like those of Dwarf Caseknife.

Nova Scotia Marrow. Refs. 43. Syns. Vineless Marrow. This variety was a once prominent strain of White Marrow which was regarded very favorably for a few years in the western New York marrow bean area, but which is now rapidly disappearing in favor of more disease-resistant kinds. It was named, in this State, from its apparent place of origin. Seeds of it, grown in Musquidobit Valley, Nova Scotia, were exhibited without name, at a Provincial Exhibition at Halifax, about 1910. The similarity of Nova Scotia Marrow to Vineless Marrow in everything except size of beans makes the supposition fairly reasonable that the seeds shown at the Exhibition were those of Vineless Marrow. This variety was quite widely, if not extensively, distributed just before 1900 and may easily have reached Nova Scotia and the other Maritime Provinces and may have been grown in isolated sections until the name was lost. These exhibited seeds attracted the attention of Mr. "Bat" Saunders, a noted rifle shot, and from a few of them he developed a small stock at Paradise, N. S. A neighbor, Allison FitzRandolph, improved the stock by selecting the largest seeds. Geo. Sanders then grew the variety from Randolph's seeds, selecting for his second crop seeds from heavy-yielding plants. Through Mr. Sanders, Prof. H. H. Whetzel of the New York State College of Agriculture learned of the variety, and he and other investigators at Ithaca secured seed of it from Mr. Randolph through the Nova Scotia College of Agriculture and the Dominion Experimental Farms. Progeny from this seed, grown by Prof. W. H. Burkholder, on United States Department of Agriculture plats at Groveland, pleased O. C. Lake, of that village and he imported considerable quantities of seed from Nova Scotia, beginning in 1919, from which he developed a stock to supply growers around Groveland. The variety was then apparently quite free from disease so that its productivity and the large size of the beans made it very popular. Seed of Nova Scotia Marrow, however, became so mixed with that of other varieties that the disease resistance apparently lessened. The dry beans were also found to split very readily, so the variety lost popularity almost as rapidly as it had gained it.

Plants about 1½ feet tall, erect, rather sparingly branched, runnerless; foliage medium to abundant, dark to medium green, dull surfaced, roughened or crumpled; leaflets very large, 4¾ to 5 inches long, almost as broad quite near base and very gently rounding to short, obtuse tips. Flowers white. Pods 4 to 4¾ inches long, almost straight, with long, almost straight, slender, rigid, central tips very broad for length, distinctly constricted between beans, green, not usable as snaps. Seeds about 4, large, of Boston Marrow

shape, oval to very short oval or usually ovate, with short-rounded ends, very plump, cotyledons often separated, while slightly veined, moderately glossy, often considerably pitted and wrinkled, about 45 to the ounce.

Paraguay. This bean came from the Guanaco Indians of Paraguay. It produces a bush plant on poorer soils, but under the best conditions becomes almost a pole bean. It is very productive, in either form, of medium sized, white beans of best quality. Burbank in 1921 was responsible for its dissemination in this country.

Perry Marrow. Refs. 43, 77. Prof. W. H. Burkholder, working at Cornell University, Ithaca, N. Y., made crosses between White Marrow and Wells Red Kidney beans, from which several hybrids developed. These were carried for several years, with constant selection for disease resistance, and several of the best strains were grown in quantity at Ithaca and at Perry, N. Y. Commercial distribution began about 1922. Some attempt was made to keep the strains separate, since many of them showed marked differences in many characters, but the stocks have now become so mixed in growers' and seed-sellers' hands that the commercial Perry Marrow is often a mixture of strains.

Pods borne mostly below foliage; also to some extent in the lower leaf axils of runners. Very pale light green in color. Quality poor; stringy, fibrous, tough and coarse in texture. Size moderately long, quite broad and plump (5½-6 x 5⁄8 x 3⁄8 inches), containing 4-5 seeds per pod. Shape nearly round, broad oval in cross-section, straight to slightly curved, straight backed, somewhat constricted both on the placental and lateral surface, fairly smooth, filled to the tip and edge and moderately rounded on the end. Spur very long, slender and slightly recurved. Suture, placental is flattened and carpellary, obtuse.

Seeds medium to large, 1.2 x .8 x .7 cm. (45-50 per oz.); short oval, plump, broad oval in cross-section; ends uniformly rounded. Hilum small, protuberant. Color shining, glossy white over entire surface, marked with a grayish, vein-like under pattern and a narrow, indistinct, pale yellowish eye-ring.

Pilot Navy. This bean was first erroneously called Early Pierpont, then Early Dupont or Dupont Navy from its discoverer, Wm. H. Dupont, of Minnesota, and finally Pilot, "the bean ahead." Will introduced it in 1913 as a sport from Golden Wax. It is a typical Navy in pod and pea, in height of plant and vining habit, but earliness and the large broad leaflets separate it from Navy Pea. The skin is very thin and cooking quality excellent.

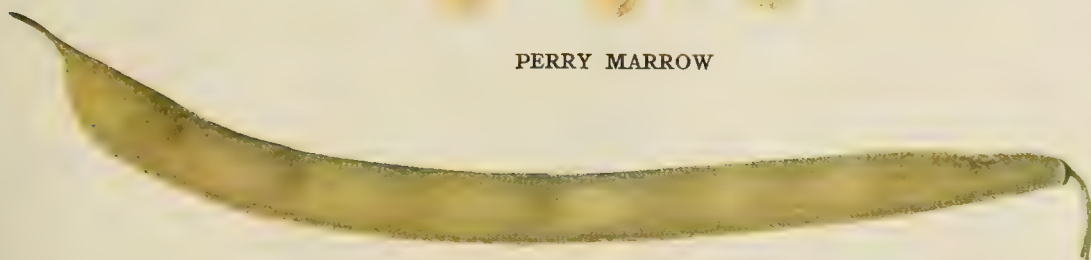
Pink. Refs. 31, 43, 44, 91. Syns. Bayo Medio, Ran Caguino, Rosa, Salmon Colored Kidney, Yura Mon. We have grown Pink several times in our tests, but it has never matured so is out of consideration for eastern bean growing sections. It excelled in popularity for California, however, only by the lima, and is also much grown in the Southwest and in Mexico. Since it is known as the White Man's Bean (Yura Mon) by the Mexican Indians, it was probably brought in by the Spanish "Conquistadores," or carried overland from Chile. Grown in California, it forms a mass of trailing vines and is very productive. The dry beans are used as baking beans, or in recent times, in the preparation of Chile con carne. Seed, light salmon pink, with rather



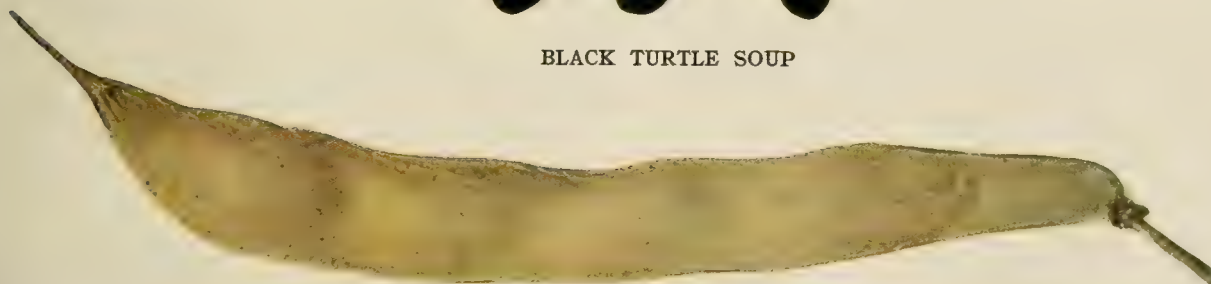
WHITE LENTAL



PERRY MARROW



BLACK TURTLE SOUP



WELL'S RED KIDNEY

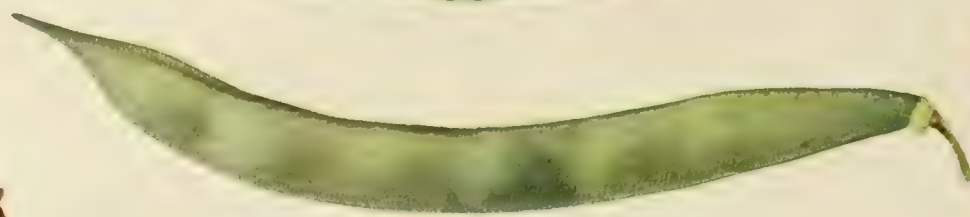


BOSTON FAVORITE

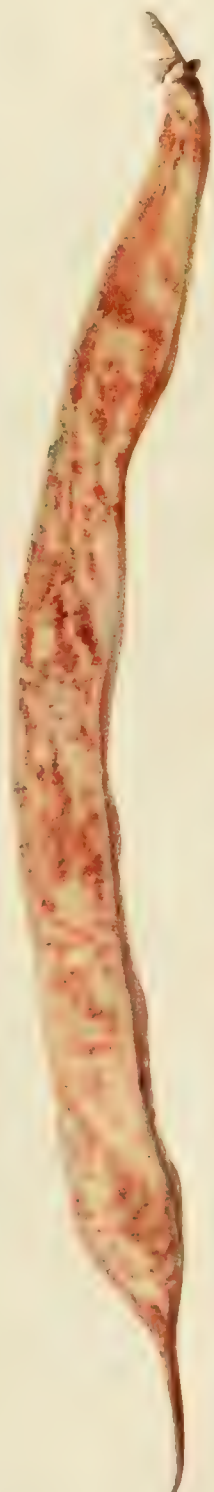


IMPROVED
ROBUST

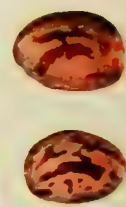
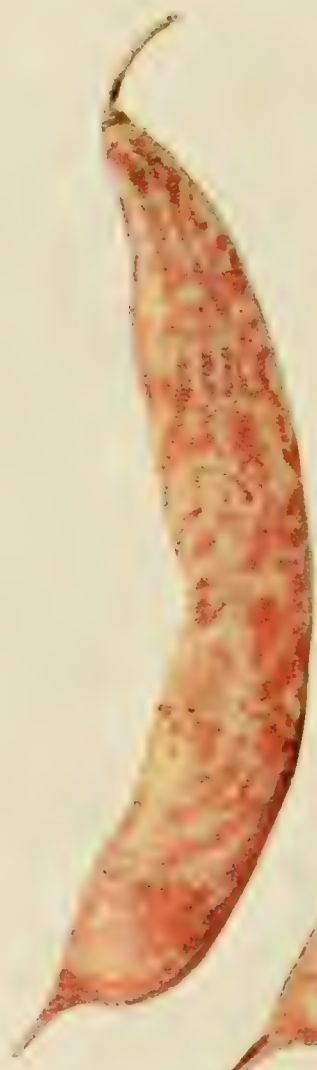
IMPROVED EARLY
RED VALENTINE



BLACK VENEZUELAN



RUSTPROOF
INTERMEDIATE
HORTICULTURAL



RUBY DWARF HORTICULTURAL

obscure light brown eye-ring, which later has a more pinkish tinge. In size the seeds are smaller, distinctly thinner, and have ends more often truncate than the seed of Bayo.

Pink-eye. This is so nearly a duplicate of White Kidney that the same description with minor changes applies to either variety. Leaflets are not quite so large; the pods are broader, $\frac{1}{2}$ to $\frac{2}{3}$ inch wide, and with coarser texture. Seeds are of the same shape but are about one-fifth larger and with a small pink or reddish spot or oblong, parallel-sided patch at each end of the eye, one of which is usually larger and longer than the other.

Pinto. At least three distinct Pinto beans are grown in Colorado and states further South and West, and all are hardy and suited for growth on dry land. None are early enough or productive enough for growing successfully in the East, nor is there any demand for beans of this color in our markets. Seeds of Mexican Pinto, the bean mostly used to prepare Chile con carne, are very much like Great Northern in size, but are somewhat more plump and without kidney-shaped indenting of the hilum. The color is like the seed color of Rhode Island Butter pole bean. Seeds of Spotted Mexican are like Red Mexican in size and shape but are "calico" spotted. The large irregular white areas are distributed with areas of dark crimson in proportions varying from half and half to solid red color.

The Siberian, Manchurian, or California Pinto of Aggeler and Musser is a smaller, plumper bean, more like Burlingame in size and shape, with under color of light brown tinted salmon and narrow more or less curved streaks of darker brown or mahogany red.

Plant medium in size, vine semi-trailing, spreading; foliage medium to dark green. Flowers white.

Pods borne mostly below the foliage; also to some extent in the lower leaf axis of runners; medium light green in color, in later stages, cream-colored and rather deeply marked with irregular brownish-purple stripes or streaks. Quality poor; tough, stringy, fibrous and coarse in texture. Size medium long, quite broad and slender, $4\frac{1}{4}$ to 5 inches long, containing 5-6 seeds per pod. Shape flat, oval in cross-section, moderately curved, straight to occasionally slightly creasebacked, constricted, not crowded, smooth, filled to the tip but not to the edge and abruptly rounded to truncate at the end. Spur long, slender and slightly recurved. Suture, placental is flat to somewhat indented, and carpellary, acute.

Seeds medium, $1.3 \times .8 \times .56$ cm. (85-90 per oz.); short, rather broad oval occasionally somewhat rhomboidal, long oval thru cross-section; ends very abruptly rounded to decidedly truncate. Hilum medium, slightly indented. Color pinkish buff (buff pink), sparingly blotched over entire surface with medium dark brown (dresden brown) and marked with a narrow, deep orange (zinc orange) eye-ring.

Red Face. A variety grown by the Indians as a soup bean. In growth habit the plant is erect and free from runners, differing in this respect from Ground Bird. The color marking while red instead of yellow resembles the Molasses Face type of Yellow Eye.

Plant dwarf, 16-18 inches tall, spread in row 10-12 inches; erect growth. Free from short runners characteristic of some field beans. Quite vigorous, moderately productive. Stem quite stout, slightly ridged, internodes medium; branches few, both medial and basal in position. Foliage medium, dull dark green; leaf surface moderately smooth, quite heavily veined, medium pubescent. Leaflets moderately small, $4-4\frac{1}{2}$ inches long by

$2\frac{1}{2}-2\frac{3}{4}$ inches wide—tip medium, rather abruptly pointed stipules medium, no tendrils present. Flowers white, borne singly and in pairs.

Pods borne intermediate and below the foliage. Color dull light green (light grape green). Quality fair; stringless, moderately brittle but coarse in texture. Size medium long, broad and moderately slender ($5-6 \times \frac{9}{16} \times \frac{5}{16}$ inches), containing 5-6 seeds per pod. Shape oval in snap stage. Broad oval in cross-section, straight, slightly creasebacked, regular, smooth, filled to the tip and edge. Spur medium short, thick, and straight to slightly recurved. Suture, placental is slightly indented and carpellary, obtuse.

Seeds medium $1.3 \times 1.0 \times .8-9$ cm. (55 per oz.); broad oval, moderately short, plump, very broad oval in cross-section; ends abruptly rounded. Hilum flat, small. Color dull white on the dorsal surface, ends and sides; marked with a large, dark reddish purple (bordeaux), regular area over the entire ventral surface.

Red Kidney. Refs. 16, 21, 35, 43, 44, 47, 48, 61, 63, 77, 89, 91. Syns. Chilean, Dwarf Green pod, French Kidney, Improved Red Kidney, Large Red Kidney, Red Turkey. Joint use of the names Red Kidney and Burr's Chilean in the *Country Gentleman* of 1874 and later references identify these varieties as probably the same. This indicates a South American origin for Red Kidney, although no date of introduction has been found. In the eastern states it was known before 1857. As with other field beans, the seed is saved by the individual grower, from home-grown or local stocks. This facilitates the development of many strains of Red Kidney, a few of which are distinct enough to merit notice. French Red Kidney is one of the older types, characterized by rather small, dark garnet brown seeds lightened with crimson violet; pods long, more slender than in most other strains, straight near the stem, but distinctly curved at the center. Wells Red Kidney comes from a single plant selected by Byron Luce, Marion, N. Y., about 1904. The stock was gradually developed and came in part into possession of John Q. Wells, Shortsville, N. Y., for whom it was named and through whom this strain became widely distributed. Seed of Wells Red Kidney is rather light colored. Other strains developed more recently have been named Geneva Red Kidney and York Red Kidney. These were developed by Prof. W. O. Gloyer from a cross between Wells Red and White Kidney beans made at this Station in 1920. The seeds are indistinguishable from Wells Red Kidney, although the plants are markedly vigorous and show much of the White Kidney growth character.

Red Kidney is widely grown in the Finger Lakes District of Central New York, is second in importance in Michigan, and is being grown increasingly in the coastal regions and internal valleys of northern California. From two-thirds to three-fourths of the total export trade in dry beans is composed of Red Kidneys sent to Cuba, Porto Rico, and other West Indian islands. There is also some demand for Red Kidneys from the pork and bean trade. It is intermediate in season for field beans. The habit of the plant is the same as that for White Kidney, the pods differing in being straighter at the stem end and somewhat flatter.

Plant large, 14 to 16 inches tall, with spread of 12 to 14 inches; erect, compact, runnerless; vigor good, intermediate in season, heavily to moderately productive, thick stemmed, branches few, green throughout. Foliage medium in abundance, medium green,

leaf surface slightly rough, slightly crumpled, medium veined, thick; leaflets large, 5 inches long by $3\frac{1}{2}$ inches wide, widest two-fifths the distance from base, rounded rather pear-shaped to base, sides long straight taper to slender tip. Flowers bluish pink.

Pods borne both above and below foliage; waxy green in color. Quality poor; tough, stringy and very fibrous. Size long, fairly broad and slender ($5-6 \times \frac{1}{2} \times \frac{7}{16}$ inches) containing 4-5 seeds per pod. Shape oval to flat, long oval in cross-section, straight, straight backed, regular to slightly constricted, fairly crowded, smooth, filled to the tip and edge and rounded to somewhat tapering at the end. Spur long, medium slender, straight and occasionally slightly curved. Suture, placental is flat and carpellary, acute.

Seeds medium to large $1.8 \times 1.1 \times .65$ cm. (40-60 per oz.), long, broad, somewhat reniform, rather flattened, long oval in cross-section; ends rounded. Hilum small, flat. Color ranges from pinkish crimson (jasper pink), and reddish brown (hay's russet) to a deep mahogany (garnet brown) over the entire body. The variation may be within or between strains.

Red Marrow. Refs. 43. This variety seems not to have been listed in catalogs nor was it described by Irish, Tracy, or Jarvis; but price quotations have often been noted in market reports and, according to Hickox-Rumsey Company of Batavia, N. Y., it has been grown near there and northward to Lake Ontario for the last 35 or 40 years. It was grown to produce a colored bean to ship to Porto Rico and Cuba.

Plant 1 to $1\frac{1}{2}$ feet tall, spreading, somewhat trailing; foliage medium green; leaflets rather larger than those of Large White Marrow, smaller than those of Perry Marrow. Flowers lilac. Pods of Nova Scotia Marrow type $4\frac{1}{2}$ to $4\frac{3}{4}$ inches long, more than $\frac{1}{2}$ inch wide, straight or slightly curved, ovate in cross-section, doubly rounded to blunt at the ends, with rather heavy rigid tips. Seeds 5, occasionally 6, about size of Nova Scotia Marrows, not as plump, longer, long ovate or oblong with ends unequal in size, often truncate; same color as light strains of Red Kidney, but darker and less flat than the variety Pink.

Red Mexican. Refs. 43, 44, 91. Syns. California Red, Mexican, Mexican Red, Red, Red Spanish, Rojo, Salinas Red. As Red Mexican came from the Indians of northern Mexico and is unknown in Chile, it is possibly a southern strain of the bean from which Hidatsa Red was developed by the Indians of the northern Plains. In California it has been known and prized as a dry-land crop since 1855. It is said to be indistinguishable from Pink in the field until the seeds begin to color. The seed is similar to Hidatsa Red; the flowers white.

Robust. Refs. 43, 77, 82. Syns. Improved Robust, Michigan Improved. Beginning with its cultivation by the Indians in New York State, the small white pea bean has been the most widely grown of the field beans. Selection for high yields and hardier plants was commonly practiced by bean growers everywhere that dry shell beans were produced. In 1908, Prof. F. A. Spragg of Michigan Agricultural College made several selections from a large collection of commercial samples of white navy beans. These original selections were made from plants that stood out as being more resistant to mosaic than the majority in the field. Seed of one of these selections was increased and introduced to Michigan farmers in 1913 and named Robust that same year by Professor Spragg. Reselections from the original strain were made and one of these was introduced to growers in 1918 and another in 1921. The later introduction was known as Improved Robust, which however has not

proved superior in production to the original strain. This selection did serve the purpose of establishing again a pure supply of seed.

The Robust bean is now, in the principal pea-bean producing sections of the country, especially in Michigan and New York, the leading field variety and is fast displacing all other strains. It is later than some other strains of Navy Pea (Crawford, Hunter, Wonder, or Michigan Improved) and rather slow in developing its very extensive root system, but when established is able to set and mature more pods than any other. The leaflets of Robust are usually more wrinkled than those of Navy and are drawn in at the edge, so that Robust holds its foliage under adverse conditions and continues green and vigorous late in the season.

Pods borne mostly below foliage; also to some extent in the lower leaf axils of runners. Color light greenish white. Quality poor; stringy, fibrous and tough. Size very short, narrow, and slender ($3-4 \times 7/16 \times 5/16$ inches), containing 6-7 seeds per pod. Shape oval, ovate in cross-section, slightly curved, straight backed, regular, crowded, filled to the tip and edge, and somewhat bluntly pointed on the end. Spur long, slender, and slightly recurved. Suture, placental is flattened and carpellary, acute.

Seeds small, $.9 \times .6 \times .55$ cm. (130 per oz.); short oval, slightly more plump than the Navy pea; ends abruptly rounded to truncate. Hilum small, slightly protuberant. Color dull white, showing more numerous and darker gray vein-like markings than does Navy.

Rouge D'Orleans. Refs. 47, 98. Syns. Scarlet Orleans. Under the name Red Orleans, which is the translation of the name here given, Burr describes a pole bean; but the only Orleans bean we find in French literature and the one grown at this Station and at the Missouri Botanical Garden is a dwarf sort. At best this variety was grown in America only experimentally, unless it was a precursor to the variety Red Marrow, grown in western New York, whose origin is unknown but which dates back to the last recorded dates for Orleans and which corresponds very closely to it. Red Orleans plants, however, put out many runners and the seeds had a black eye-ring.

Snowflake. Refs. 48, 63, 84, 85, 91. Snowflake was introduced in 1888 by Gregory who claimed it to be the earliest and most productive pea bean, but Tracy and Jarvis found it less productive than Navy with narrower pods and smaller seeds. From Gregory's figure of plant and pods, data from a Kansas test in 1890, and our own recent tests, the seeds seem to be fully as large as those of Navy. At present it is little grown outside of Maine and Massachusetts.

Soldier. Syns. Johnson Bean. This is a bean grown in Maine and New Hampshire which is very similar to China Red-eye, but, as grown here, has taller plants, rather finer foliage, much longer and slenderer pods, containing 6 beans which are long, kidney-shaped rather than oval. The seed markings are similar to the markings on Brittle Wax and Old Fashioned Yellow Eye, but are a brownish red in color. It is a good bean for baking.

Sulphur. Refs. 43, 48. Syns. California Cream, China Yellow, Eureka, Golden Cranberry, Golden Drop, Robin's Egg, Self-seasoning. Older names should take

preference over Sulphur, but as this is practically the only name now listed, it is used to introduce a very old variety. It was probably first known in America as China Yellow or Yellow China, but these names occur only as synonyms in publications of the past 60 years. Golden Cranberry, with several synonyms, followed China Yellow; then Robin's Egg and Golden Drop were used, succeeded by Eureka, California Cream or Pea, Sulphur, and Self-seasoning. Careful study of available descriptions shows little, if any, difference between the plants, pods, or seeds of the strains thus differently named. Of the names given, Eureka seems to have a distinct history, this being used by the Ford Seed Company in 1893 to reintroduce an old variety; also, Self-seasoning was used in the same way by Gill in 1918.

All of these varieties or strains must be considered undesirable as snap beans, and even the green-shell beans are rather too small for wide use. They are in season with Navy Pea as dry shell beans and are considered by some excellent for soup or baking because of a rather distinct flavor. The variety is not especially productive.

The Yellow Canada of Burr carries as a synonym Round American Kidney which he also gives as a synonym of Golden Cranberry, but the dry beans differ in having a red rather than greenish line about the hilum, as have the other varieties described.

Plant 1 to 1¼ feet tall, with heavy, erect stem, well branched and quite spreading, but very few or no runners; foliage abundant, medium to dark green, glossy, considerably crumpled; leaflets large, broad, shortly taper-pointed. Flowers phlox pink. Pods 4 to 4½ inches long, ⅞ to ½ inch wide, plump, straight or slightly curved, slightly constricted, ends double rounded, with ½ inch rather heavy, rigid, slightly curved tip from near center. Seeds usually 5, about 75 to 80 to the ounce, small to medium; short ovate with protuberant eye, very plump, ends short-rounded, cream or light sulfur yellow in color, slightly veiny, with a narrow, faint greenish eye-ring which may darken to brown or chocolate.

Thousand-fold Dwarf White. This was a very old pea of German origin; late and of no particular value and now unknown by name. It was intermediate between Dwarf Princess and Dwarf Rice.

Plants 1 to 1½ feet tall, very much branched, with many runners of equal or greater length; pods short, 3 to 3¼ inches long, narrow, straight, with strong, short tip; seeds 4 or 5, oval, slightly flattened or lenticular, slightly larger than those of Dwarf Rice, white in color.

Turtle Soup. Refs. 13, 43, 47, 48, 56, 91, 97, 98. Syns. Black Turtle Soup, Black Spanish, Brazilian Running Bean, Tampico, Venezuelan. Turtle Soup is a very old variety grown as a field bean. It apparently originated in northeastern South America or possibly in Chile and was widely found, as shown by its many Spanish, Portuguese, Mexican, and Indian synonyms. It was taken to Europe presumably by Spaniards and was listed by Zuciagui, an Italian botanist, in 1806. Irish says it was known in Germany before 1860, but we find no record of its growth in France. In the United States, Thorburn offered it as early as 1832, but it was known in the South long before that time. The only real use for the variety is for making soups, to which the dry black beans give a distinct flavor and a greenish color somewhat similar to that of the green turtle soup

so popular along southern sea coasts. Turtle Soup is quite productive, the young pods are crisp and tender, but they soon become very tough and stringy and are poor in color, being marked with purple; while the green-shell beans are too small to be desirable for cooking. It is very late in season, occasionally failing to mature in the North, and is quite different in growth habit from any other sort.

Plant considered dwarf, 15 to 18 inches high, spreading and very thick, throwing out many runners that may reach 2 to 4 feet if poles are supplied; extremely vigorous, very hardy and productive; stems erect; branches moderate in number, quite purple. Foliage only medium abundant, light green, rather small, 3 to 3½ inches long, 2 to 2½ inches broad, surface pubescent, slightly wrinkled, a little rough, thin; leaflets broadly oval or heart shaped, slightly taper pointed with blunt tips. Flowers rose purple.

Pods borne well below the foliage also to some extent in the lower leaf axils of runners; dark green in color. Quality poor; tough, stringy, fibrous and coarse in texture. Size medium long, broad and slender (4-5½ x ⅞-½ x ¼-⅜ inches), containing 7-8 seeds. Shape flat; oval thru cross-section, straight to slightly curved, straight-backed, moderately constricted, fairly crowded, smooth, filled to the tip and the edge and abruptly rounded at the end. Spur moderately long, slender and recurved. Suture, placentar is flattened and carpellary, moderately acute.

Seeds small (1.15 x .65 x .45 cm.) containing 150-60 per oz. Shape sub-reniform, quite flattened; ends abruptly rounded or decidedly flattened or squared, probably due to the close arrangement in the pod. Hilum small and depressed or indented. Color jet black over the entire surface. Apparently there are two strains that differ in this respect; one is a shining jet black after the sparse bloom has been removed and the other is a very dull, unattractive black.

Vineless Marrow. This was one of many strains or types grown in western New York before 1900, but was first recommended and cataloged by Ferry in 1896. It became quite generally distributed and was also known and widely grown on the Pacific Coast. Except in small areas in this State, it was not extensively grown and gradually lost popularity until only two seedsmen listed it in 1921.

Plants large, erect, with comparatively few branches; runnerless; foliage coarse, medium green. Flowers white. Pods of medium length, straight or slightly curved, with heavy straight tips nearly central on rounded ends, broad and heavy, constricted, green, not edible. Seeds of Nova Scotia Marrow type, not quite as large, distinctly ovate, among best of marrows for baking and large enough for fairly satisfactory use as green-shells.

White Flageolet. Refs. 13, 16, 26, 47, 48, 53, 63, 93, 94, 97, 98. Syns. First of All, French Flageolet, Stanton, White Canterbury, White Swiss. White Flageolet or White Canterbury is a very old variety, probably being the "Larger White dwarf" of Mawe-Abercrombie, and the ancestor of the many varieties and strains of white, kidney-shaped beans now known and of more numerous ones that have passed from cultivation. Like all varieties that have been in cultivation over a long period, many improved strains of White Flageolet have been offered, several of which were considered to have separate characters and therefore were introduced under an entirely different name. White Flageolet is the same as Triumph of the Frames in habit of growth and character of foliage; the pods are slightly smaller, more curved, darker in color, and more depressed between beans.

First of All was called new by Vilmorin in 1883, who credits its origination to Mons. Bonnemain, Secretary of the Etampes Horticultural Society. As tested at Geneva it was considered the same as White Flageolet but earlier and more vigorous. French Flageolet originated by the same improver was also considered as an improved White Flageolet. Vaughan considered French Flageolet to be a sport of Canadian Wonder (crimson seeded). Stanton is probably White Flageolet. It was brought into Onondaga County many years before 1893 by Rufus Stanton. The notes regarding earliness and size, shape, color, and quality of the beans prove it very similar to the Flageolets; yet the failure to mention extra length of pods excludes French Flageolet.

Plant $1\frac{1}{3}$ to $1\frac{1}{2}$ feet tall, often smaller, strong, many branches, not twining, quite leafy; leaflets dark green, rather small, broadly ovate, often slightly heart-shaped, short-pointed, rather thin and papery. Flowers white. Pods $5\frac{1}{2}$ to 6 inches long, sickle shaped, green while young, yellowish white at maturity. Ready as snaps in 7 weeks, as green shells in eleven weeks, and mature in thirteen weeks. Very productive, young pods crisp and tender. Seeds 6, rarely 7, white, kidney-shaped, flattened, three-fourths inch long, three-tenths inch broad; either green or ripe remarkable for delicacy of flavor, ripe seed polished, ivory like, white.

White Kidney. Refs. 10, 12, 13, 15, 16, 28, 29, 38, 43, 47, 48, 49, 54, 56, 61, 63, 66, 77, 91, 93, 94, 97, 98. Syns. Imperial Dwarf Kidney, Royal Dwarf Kidney, White Date Bean. Beans of the White Kidney type are more than a century old in the United States, appearing in the catalog of Thorburn as early as 1822. The White Canterbury beans of Mawe-Abercrombie were small-podded snap beans; but Long White Canterbury grown at Geneva in 1883 was found to duplicate White Kidney, though ripe two weeks earlier and far less disease-resistant. White Swiss was equally hardy, but put out more runners and produced larger, oblong rather than kidney-shaped, pure white beans. Krup Morgenhäuser, grown at this Station in 1883, was a White Kidney with many runners. Oliver Field, introduced by Vaughan in 1906, was said by him to be as early as the Marrows; but Tracy, after a rather incomplete trial, considered it to be only a very good stock of White Kidney. Martens classed White Kidney under *Phaseolus oblongus albus*.

White Kidney is very similar in most respects to Red Kidney, later in season, with seed white instead of red, and leaflets larger and wider. Imperial or White Imperial is sometimes grown in place of White Kidney. Seed of Imperial is smaller, straighter across the eye, less yellow around eye, veining more prominent.

Plant very large, 15 to 18 inches tall with spread of 15 inches or less; very erect, bushy, compact, without runners; very vigorous, productive of long bearing period; thick stemmed, moderately branched, green thruout. Foliage abundant, dark green; leaf surface crumpled, rough, heavy veined, slightly pubescent, thick, leaflets large, 5 inches long by 4 inches wide, widest near base, terminal leaflet well rounded, side leaflets often quite one sided, but even so, rounded, appearing as circular except for short triangle with short tip. Flowers white.

Pods borne both above and below the foliage; light green in color. Quality poor; very stringy, tough and fibrous. Size long, broad, and slender, ($5\frac{1}{2}$ -6 x $\frac{3}{8}$ - $\frac{5}{8}$ x $\frac{1}{4}$ inches), containing 5-6 seeds per pod. Shape flat, ovate in cross-section, straight backed,

regular to somewhat constricted, crowded, smooth, filled to the tip and edge and rounded at the end. Spur long, slender and recurved. Suture, placental is flat to somewhat rounded, and carpellary, acute.

Seeds large, 1.6 x .8 x .6 cm. (45-50 per oz.), oblong to distinctly reniform, fairly plump to somewhat flattened; ends rounded. Hilum medium, somewhat protuberant. Color white to slightly cream, especially about the hilum, dull, distinctly veined.

White Lental. The name Lental may be a misspelling of lentil, a group of forage and seed-producing plants allied to the peas which have lens-shaped seeds only slightly smaller in diameter than the length of the seeds of White Lental. White Lental is, however, a true bean which appears identical with a Russian (Siberian) variety grown here under the name Small White Ekaterinoslav. It is early, ripens evenly, and produces good yields of small pods. The beans, which are very small, are said to be unequalled in flavor for soups or baking. Gill Bros. introduced this bean in 1918.

Plants very similar to those of Navy Pea, but smaller, more slender and finer in every way, much branched and with many short runners. Pods short, $2\frac{1}{4}$ to $2\frac{7}{8}$ inches long, of medium width, round, plump, slightly constricted, well filled, with rounded to pointed ends and long, slender, recurving tips. Seeds about 6, very short oval approaching spherical, usually less than $\frac{1}{4}$ inch long, almost as wide, and more than half as thick, cream-colored.

White Marrow. Refs. 10, 13, 16, 29, 41, 43, 48, 49, 61, 63, 77, 91. Syns. Dwarf White Cranberry, Great Western, Marrowfat, Mountain, White Cranberry, White Marrowfat, White Egg. Although a very old variety grown in the United States for more than a century, White Marrow is still more widely listed under this name or some of its many variants and synonyms than any other field bean except Red Kidney, though both of these are grown on smaller acreages than Navy or Boston Pea bean. Large Marrow, or Mountain, is probably identical to White Mammoth, the differences, if constant, lying in the direction of more slender plants with longer runners and possibly larger seeds. Boston Marrow was listed in 1856 as a baking bean and has been offered more or less constantly since that time by a few seedsmen, but its cultivation seems to be very local. Its seeds are noticeably larger than those of Large White Marrow. It appears to be a selection of White Marrow.

Plants large, $1\frac{1}{6}$ to $1\frac{1}{2}$ feet tall, with heavy stems and many branches, very spreading and with many quite long, trailing runners, green thruout; foliage medium green, slightly crumpled; leaflets 4 to $4\frac{1}{2}$ inches long, $3\frac{3}{4}$ to 4 inches wide near base, slightly rounded to short, blunt tip. Flowers white. Pods 5 inches long or more, almost straight, sometimes slightly hooked or enlarged near tip, nearly $\frac{1}{2}$ inch wide, thick, constricted between beans, green, not edible. Seeds 5, occasionally 6, rather short, plump ovate, with fully rounded ends, about 80 to the ounce.

Yellow Eye. Refs. 23, 43, 48, 77, 91, 97, 98. Syns. Dot Eye, Imperial Yellow Eye, Improved Yellow Eye, Molasses Face, Yellow-Eyed China. Beans of the Yellow Eye type are very old and exceedingly apt to vary, through environmental conditions as well as by breeding and selection, so considerable confusion exists in bean literature in regard to the different strains. The oldest known reference is that in Martens whose illustration shows a type very similar to that of the Old-Fashioned Yellow Eye of Jarvis. Burr's description of

Yellow Eyed China also conveys the idea of a bean quite prominently colored about the eye, somewhat "butterfly marked." There are but three varieties of the Yellow Eye bean that are of commercial importance. The Improved Yellow Eye (or Molasses Face) is the variety most commonly called for in the Boston market.

Seed, medium large to large, slightly less than $\frac{5}{8}$ of an inch, proportionately broad, plump, width $\frac{1}{2}$ of the length, rounded at each end, no taper at either end, straight at eye. Color, outside the eye, clear opaque white, eye pattern large and should cover about one-fourth the area. Viewed from top should show a very narrow margin of white on all sides of eye with exception of anterior end (micropyle) where color may extend farther towards the lower surface, color surrounding hilum may be slightly darker.

Old-Fashioned Yellow Eye is grown in Maine and Vermont and the claim is made by many that this strain bakes much better and has a better flavor than any other.

Seed, slightly more flattened laterally than the Improved, slight taper towards anterior end, which end is also slightly truncated, dorsal side rounded and taper towards the anterior end. Ground color clear, opaque white; pattern, three color areas, the first, a rather narrow strip of pigment extending anteriorly from the front of micropyle to apex of bean; second, surrounding the micropyle and extending in form of horse-shoe around anterior end of hilum may or may not unite with anterior stripe; third extends posteriorly, almost to posterior edge of bean, posterior edge often forked, starting behind caruncle two rather broad wings extend forward along sides of hilum. These wings should not unite with color area surrounding the micropyle.

Imperial Yellow Eye or **Dot Eye** is the last important type and is named because the markings consist of two small dots or blotches of color on either side of the hilum. This type is gaining in popularity and is also favored by some packers. For an extended treatise on the Yellow Eye see the account in Pearson and Surface in *Maine Agr. Exp. Station Bul. No. 239, 1915.*

Plant either erect or trailing according to the strain, leaflets large, dark green, thick surface rough, crumpled, terminal widest $\frac{1}{4}$ distance from base, straight sided, long taper to slender point, side leaflets, unequal sided, straight across base, taper to long curved tip. Flowers white.

Pods borne below foliage; also to some extent in the lower leaf axils of runners. Light waxy green in color. Quality poor, very tough and stringy, quite fibrous and coarse in texture. Size medium long, broad and rather slender, ($4\frac{1}{2}$ -5 x $\frac{3}{8}$ - $\frac{1}{2}$ x $\frac{5}{16}$ inches), containing 5-6 seeds per pod. Shape flat, long oval in cross-section, straight or slightly curved, straight backed, slightly constricted, fairly crowded, smooth, filled to the tip and rounded at the end. Spur long, slender, straight or slightly curved. Suture, placental is flat and carpellary, acute.

THE LIMA BEANS

The varieties of lima beans in cultivation today are evenly divided between pole and dwarf types. Bailey, 1895-96, Ref. 7, 8, discussed the origin and introduction of most of these varieties. The ancient history of the lima bean is given in detail in a more recent publication by Van Eseltine (*Variation in the Lima Bean, Phaseolus Lunatus L., as Illustrated by its Synonymy. New York State Agr. Exp. Sta. Tech. Bul. No. 182. 1931*). A plant native to South America, where it grows as a perennial, the lima bean was introduced into the United States several times.

One of the earliest introductions, recorded in 1824, was made by Captain John Harris, U. S. N., who brought some seed from Lima, Peru, and grew it on his farm at Chester, N. Y. Before this time plants had been grown in the South, being mentioned by Lawson in his voyage to Carolina in 1700-08. These plants as found in cultivation by the Indians and early settlers of Carolina probably came from the West Indies. It is certain that after 1825 the lima came into general cultivation as a garden vegetable in the eastern states.

The greatest impetus to the production of this group of *Phaseolus* in America came when its possibilities as a field crop for California was recognized. The first recorded information on the lima in California (Hendry) is an advertisement by H. McNally Company of San Francisco in the *Alta* of 1855. In 1872 they were tried in the Carpinteria Valley, and in 1875 they were first grown for an eastern seed firm, Dexter M. Ferry. About 1890 a strain known as Lewis originated on the farm of Dozier Lewis, and became the one most commonly grown although thought to be a mixture of several varieties. After the determined fact that certain areas, particularly in Santa Barbara, Ventura, Orange, Los Angeles, and San Diego Counties, Calif., were well adapted to the growth of the lima, production increased tremendously. Practically all of the dry lima bean seed and all of the seed for eastern growing is now produced in that region. Green shell limas are produced as a garden crop in nearly every state in the country, but the production of dry seed is a specialty of California.

The dwarf varieties as garden limas all appeared in public during the decade of 1880 to 1890. They came as sports from pole varieties and were popular from the time of first introduction. The Henderson and Dreer were introduced in 1889 and the Burpee in 1890. Stocks of these three types, "sieva," "potato lima," and "flat lima," had been grown for several years by individuals and finally found their way to commercial seedsmen. The only other dwarf variety which has gained commercial importance is the Fordhook, a potato lima type.

The pole varieties of lima beans have been in cultivation for many years, but from time to time improved strains earlier in season and with larger seeds have been offered. The large flat types and the sievas occur in the pole varieties as well as in the dwarfs, but the potato type, with the exception of the Challenger, is not so generally represented. While it is true that 19 varieties of pole limas and 13 varieties of dwarfs have been described and that many other names occur as synonyms, a study of individual seed catalogs will show the relatively few varieties carried by any one house. Inspection of these so-called varieties growing in the field (both dwarfs and poles) shows only a few distinct types. The true separatory characters between many varieties of lima beans apparently well established are exceedingly difficult to measure or describe definitely.

POLE VARIETIES

Black Lima. This variety was introduced by Burpee in 1892, at which time he distributed several thousand trial packages to the trade for observation. Although it was evidently vigorous, hardy, productive, and quite resistant to rot, its seed color reacted as a detriment to its popularity. Black Lima was undoubtedly only a strain of Florida Butter; probably a selection in which a greater percentage of the dry seeds were black or very dark colored. Jarvis considered it synonymous with Florida Butter, but inasmuch as the variety was never grown at this Station, his statement can neither be verified nor disproved.

Carpenteria. Syns. Carpenteria Large Green Seeded, Green Prolific, Green Seeded, New Carpenteria. This variety originated from the seed stock of two Burpee Improved Bush Lima plants. The plants were discovered by Henry Fish of Carpenteria, California, in 1906, and apparently sold to several seed houses that introduced the variety about 1910. It has been suggested that since Burpee Improved originated as a sport in a field of Challenger Pole Limas — incidentally by the same man but in a different field — it would seem that Carpenteria might be a reversion to the primary pole types and not to Challenger which is a thick-seeded potato variety. At the time Burr wrote his *Field and Garden Vegetables of America*, in 1863, there were five distinct types of limas — all poles. Among these was one known as Green Lima, then called a sub-variety of the Common Lima, differing chiefly from that variety in having pea green colored seeds. Today, even as then, stocks of lima beans are badly mixed, thereby necessitating careful selection and skillful cultural methods in order to keep a strain pure to any degree of permanency. Carpenteria is one of the first pole varieties to maintain the green pigment consistently. It is suggested, then, that the variety must have been linked in some manner to the original green-seeded variety of Burr's period. Although the variety today is not classified as popular as is King of the Garden, Leviathan, or Small White, it does rank as medium in importance. This is due largely to its seed color, moderately heavy production, and vigorous growth. At Geneva it required 102 days to reach maturity, the same as Sunnybrook, 2 days earlier than Dreer's Improved, and 5 days later than Small White.

Plant tall, vigorous, climbing; moderately heavy yielder, but rather short seasoned in Geneva. Foliage moderately abundant, medium green, vines whitened, few small white areas between vein, dull finish, smooth, moderately thick, but quite leathery. Leaflets large, 4-5 x 2 $\frac{1}{4}$ -2 $\frac{1}{2}$ inches. Petioles medium long. Flowers white.

Pods medium to light green in color. Size long, broad, and quite slender (4-5 x 1-1 $\frac{1}{2}$ x $\frac{3}{8}$ - $\frac{1}{2}$ inches), containing 3-5 seeds per pod. Shape flat, long oval in cross-section, straight, straight backed, fairly regular, moderately crowded, smooth, filled to the tip but not to the edge and squared at the end. Spur short, thick and straight. Suture, placental is flat and carpellary, acute.

Seeds large, 2.0 x 1.35 x .5 cm. (25-30 per oz.); long broad reniform, occasionally semicircular, elliptical thru cross-section, flat; ends uniformly rounded. Hilum medium, flat and slightly incurved. Color pale greenish white to dull white, marked with rather prominent, darker shaded, converging lines radiating from

the hilum to the dorsal margin. Surface moderately smooth. Quality excellent.

Challenger. Refs. 8, 9, 10, 15, 22, 24, 29, 41, 48, 57, 58, 63, 77, 85, 91, 97, 98. Syns. Dreer, Dreer's Improved, Elliot's Improved Pole Lima, Forbes Potato Pole, Improved Challenger, Noll's Ideal Potato Pole Lima, Potato Pole Lima, Shotwell's Pole Lima, Shotwell's Improved Thick, Walters Prolific Pole Lima, Walters Prolific Potato Leaf, Walter's Prolific Thick. A variety which was called Dreer Pole Lima is said to have originated with Mr. Kimber of Kimberton, Pa., about 1857, and was introduced by Henry A. Dreer in 1875. About the same time V. J. Hadden of East Orange, N. J., had been growing a variety known as Challenger for many years. John M. Kumerle of Newark, N. J., whose attention had been attracted to it, secured some of the seed and later sold it to J. M. Thorburn, who introduced it in 1882 under the name it now bears. At that time it was said to be an improvement over the Dreer and some seedsmen undoubtedly offered it as such. Today, most seedsmen and authorities consider the two varieties identical — certainly the seed of Challenger has been often substituted for Dreer. It is fairly safe to say that the best strains of Challenger are more productive of longer pods than the Dreer, but otherwise they may be considered the same. Challenger is one of the old well-known and still popular varieties of the potato-seeded type. It is apparently better adapted to the East and North than to other sections of the country. It is considered excellent for both home and market gardens, and next to the small-seeded varieties, like Sieva and Henderson, is one of the most sure croppers and productive varieties in its class. In season Challenger came to maturity in 102 days at Geneva, 5 days later than Small White, and the same as King of the Garden. It is interesting to note that the Dreer strain produced edible beans two days later. Challenger differs from the Large White chiefly in that the leaflets are more narrow, longer pointed, and duller green in color; pods shorter, thicker, and much straighter, dry seeds are smaller, decidedly more plump and nearly sub-circular in outline. The pods and leaves are similar to Dreer's Bush, although somewhat larger and much later in season.

Plant climbing 6-8 feet with a 2 foot spread at the base. Vigorous, very productive, quite late in season. Fairly stout stems, many branches both medial and basal in position. Foliage abundant, medium dull grayish green in color; veins lightly colored; surface smooth, practically without pubescence and medium thick. Leaflets large, rather long pointed but broad at the base (4 $\frac{1}{2}$ -5 x 2 $\frac{3}{4}$ -2 $\frac{7}{8}$ inches). Petioles medium long. Flowers white, peduncle moderately long, semi-rigid.

Pods medium green in color. Size moderately long, very broad and quite plump, (3-4 x 1 $\frac{1}{4}$ x $\frac{3}{8}$ - $\frac{1}{2}$ inches), containing 3-4 seeds per pod. Shape flat, long broad oval thru cross-section, straight, straight backed, slightly constricted, moderately crowded, smooth, filled to the tip but not to the edge and square at the ends. Spur very indistinct, extremely short, stout and straight. Suture, placental is flattened to slightly rounded and carpellary, acute.

Seeds medium large, 1.7 x 1.3 x .75 cm. (30-35 per oz.); nearly semicircular, ventral surface inclined to be somewhat protuberant, elliptical thru cross-section, quite plump; ends uniformly rounded



LONG JOINTED POLE LIMA — DREER

(Natural size)



SHORT JOINTED POLE LIMA — LARGE GREEN SEEDED

(Natural size)

and occasionally inclined to be somewhat blunt or squared. Hilum large, flat. Color dull and occasionally greenish white, indistinctly marked with darker shaded, converging lines from the hilum to the dorsal margin. Surface smooth. Quality excellent.

Detroit Mammoth. This variety was introduced by D. M. Ferry & Company in 1917, apparently after many years of careful selection. Although of considerable importance as a type, this particular variety is listed by comparatively few seedsmen. The plant is very similar to Challenger with foliage perhaps slightly darker. Pods and seeds look identical to Burpee's Giant Podded, varying in size, as suggested in the discussion of that variety, with some strains that produce pods as much as 7 to 9 inches long and $1\frac{1}{4}$ to $1\frac{1}{2}$ inches wide down to the more average figure reported in the detailed description.

Extra Early Jersey. Refs. 8, 9, 24, 29, 45, 48, 58, 59, 63, 75, 91. Syns. Bliss's Extra Early Pole Lima. Bliss, Early Jersey, Extra Early, Jersey. This well-known variety originated in Lewaren, N. Y., and was introduced by B. K. Bliss and Sons as Bliss's Extra Early in 1878. It later acquired the name Jersey by some combination of which it has been known ever since. It is considered quite satisfactory for home gardens, but Seiberts Pole and Leviathan are more desirable for both home and market gardens. At Geneva, Early Jersey was one of the earliest of the large-seeded pole limas, coming into bearing in 99 days, 5 days earlier than Dreer's Improved, 3 days earlier than Seiberts, and 2 days later than Small White. Extra Early Jersey somewhat resembles Seibert, differing from this variety in being a few days earlier, less productive, and with smaller pods and seeds. It also compares similarly with Large White, being slightly earlier in season and having shorter pods.

Plant large, climbing 5 feet or better with a 2 foot spread at base; moderately productive; vigorous, multi-branched, thick-stemmed, moderately long bearing season. Foliage abundant, medium to dark green, no grayish tinge present, smooth, light veined, very slight amount of pubescence and medium thick. Leaflets medium large, 5 x 3 inches, broad, petioles moderately long. Flowers white, becoming cream colored with age, peduncles moderately long.

Pods medium dark green. Size medium long, very broad and moderately slender ($4-4\frac{1}{2} \times 1-1\frac{1}{4} \times \frac{7}{16}-\frac{1}{2}$ inches), containing 3-4 seeds per pod. Shape flat, long oval to oblong ovate in cross-section, moderately curved, occasionally slightly twisted, straight backed, somewhat constricted, not crowded, smooth, filled to tip but not to the edge and square at the end. Spur very short and indistinct, stout and straight. Suture, placental is flat to slightly indented and carpellary, acute.

Seed medium to large, $2.0 \times 1.45 \times .55$ cm. (20-25 per oz.). Nearly semicircular, somewhat sub-reniform, moderately long, broad, flattened, elliptical thru cross-section; ends uniformly rounded. Hilum medium, flat and slightly incurved. Color white with a slight greenish tinge, marked with darker shaded, indistinct, converging lines from the hilum to the dorsal margin. Surface relatively smooth. Quality fair to good.

Florida Butter. Refs. 91. Syns. Old Florida Pole, Speckled Beauty, Speckled Pole Lima, Spotted Butter. This lima is one of the oldest of its type. Its origin is unknown to the authors, but inasmuch that Burr listed a small sieva type pole lima, known as Mottled Sieva, it is quite possible that it was the

type forerunner of the present-day Florida Butter. The rise and decline of the variety's popularity have been quite periodical. At the time of Tracy and Jarvis, the variety was little known, since Tracy states that the variety was no longer listed by American seedsmen. However, about 1910 or 1911 the variety was revived and once more listed. Florida Butter has been and still is most suitable for the southern states. It is considered by many the most prolific of limas, and as such has gained an important position in the cropping system of southern growers. The vine and the size and shape of the seed readily classify it as a member of the sieva group, but the characteristic color markings on the seeds make it a distinct variety. It has been confused by some with Jackson Wonder, Calico, and Mottled, but on the basis of seed characteristics it cannot be considered synonymous with them. Undoubtedly Florida Butter seed has been sold as Calico, thus leading to confusion. With the exception of seed color, the variety is most similar to Small White, differing from that variety in being slightly more vigorous of vine and a trifle more productive, although slightly later in season in most localities. At Geneva, Florida Butter produced edible seeds in 97 days, the same as for Small White, 1 week earlier than Dreer's Improved, and 5 days earlier than King of the Garden.

Plant similar to Sieva, tall, climbing 5-8 feet or more, with a 2 ft. spread at the base of plant. Vigorous, large yielder over a comparatively long bearing season. Stem moderately slender, multi-branched. Foliage abundant, dark glossy green, smooth, light-veined. Without pubescence and medium thick and leathery. Leaflets medium, very broad, $3\frac{1}{2} \times 2\frac{3}{4}$ inches, occasionally somewhat larger, but always in the same proportion. Petioles moderately long, slender. Flowers white. Peduncles long, clustered, rather limp.

Pods medium dark green. Size short to medium, fairly broad, and quite slender ($3-3\frac{1}{4} \times \frac{7}{8} \times \frac{1}{4}-\frac{5}{16}$ inches), containing 3 seeds per pod. Shape flat, long oval to oblong ovate in cross-section, slightly curved, somewhat curled or twisted from side to side, straight backed, regular, not crowded, smooth, filled to the tip but not to the edge and gradually rounded, almost tapering at the end. Spur moderately long, slender and straight. Suture, placental is flattened and carpellary, acute.

Seeds small, $1.55 \times 1.05 \times .45$ cm. (70-75 per oz.), broad sub-reniform, somewhat semicircular, flat, elliptical thru cross-section; ends, one somewhat wider and more evenly rounded than the other. Hilum medium, flat and slightly incurved. Color light buff (Tillent-buff) blotched and irregularly spotted with reddish brown (Hessian brown), deep maroon (Harp maroon), or nearly black over one end and a portion of the sides, hilar and dorsal surfaces. The buff colored portion is very finely speckled with the same variations of shades; a moderately wide, purplish-black eye-ring is evident. Surface smooth; quality fair to good.

Fords Mammoth. Refs. 8, 24, 41, 48, 58, 59, 85, 91. Syns. Ford, Fords Extra Large Mammoth, Fords Mammoth-Podded Lima, Mammoth Kidney-shaped. The variety originated with James Ford, a market gardener near Frankford, Pa., as a selection from Large White. It was introduced by Johnson and Stokes in 1889 who had purchased the entire stock of the originator. The variety has often been considered quite similar to King of the Garden in utility and value. Although the pods and seeds are supposed to be larger than the above-named variety, it has never approached the position of

importance assumed by it. This has been caused, undoubtedly, by the lesser productiveness of Ford. At Geneva, edible seeds were produced in 104 days, the same as Challenger and 5 days later than Extra Early Jersey. The variety has changed very little in the past 20 years. It still most resembles King of the Garden, having pods about the same size, containing three to four large white seeds. Formerly it was considered to have much longer pods with five to six seeds, but at the Geneva trials this was not found to be consistently true.

Plant large, 5-8 feet, vigorous climber, moderately to poorly productive over a comparatively short season, nearly the last to come into bearing. Thick-stemmed, multi-branched, both medial and basal in position. Foliage abundant, medium to light green, dull, smooth; pubescence absent, or very fine, thick and leathery. Leaflets large, quite long ($3\frac{3}{4} \times 5\frac{1}{2}$ inches), quite sharply tapering. Petioles moderately long. Flowers white, peduncle long, quite rigid.

Pods medium light green in color. Size very long, broad and moderately plump ($4\frac{1}{2} \times 1\frac{1}{8} \times \frac{3}{8}\text{--}\frac{1}{2}$ inches), containing 3-4 seeds per pod. Shape flat, long, moderately broad oval in cross-section, quite straight, somewhat curled or twisted from side to side, straight backed, regular, not crowded, smooth, moderately well filled to the tip and edge and abruptly rounded to square on the end. Spur absent or very short, moderately stout and straight. Suture, placental is flattened and carpellary, acute.

Seeds large, $2.1 \times 1.5 \times .55$ cm. (25 per oz.); broad sub-reniform, occasionally nearly semicircular; flat, elliptical in cross-section; ends quite uniformly rounded. Hilum medium, flattened and incurved. Color quite uniformly very pale, greenish white, indistinctly marked with converging lines of a slightly darker shade. Surface comparatively smooth. Quality excellent.

Giant Podded. This variety was introduced by Burpee in 1910 who gives credit for the origination to a N. S. Prime of Huntington, Long Island. In 1905, Henry F. Mitchell introduced a variety called Giant, evidently considered at the time as an improvement over Salem Mammoth in having slightly longer pods. Today these two strains, as well as certain other large-podded strains, have intermixed so that Giant Podded is practically identical with the better varieties of the long-podded Large White type, resembling Salem Mammoth perhaps more than any other. The variety is quite generally listed by American seedsmen today. It undoubtedly has gained its present position because of its unusually long broad pods, which in some strains and in some sections are considerably larger than most. At Geneva some pods were found to be 8 to 10 inches long and $1\frac{1}{2}$ to $1\frac{3}{4}$ inches wide. The average, however, was somewhat less, as reported in the detailed description to follow. In season, Giant Podded came into harvest in 104 days, the same as Detroit Mammoth, but 1 day later than the leading large-seeded varieties Carpenteria, King of the Garden, and Seiberts.

Plant large, climbing 8-10 feet, with a spread at the base of 24-30 inches. Moderately vigorous, medium productive. Thick stemmed and medium number of branches more like medium thick, short limber twiners, both basal and medial in position. Foliage abundant, medium to dark green, grayish tint nearly absent, smooth or very slightly pubescent, light veined, medium thick and leathery. Leaflets quite long, but medium wide at the base ($4\frac{7}{8}\text{--}5 \times 3\frac{1}{4}$ inches). Petioles medium short. Flowers white, large. Peduncles long and fairly rigid.

Pods dark dull green in color. Size long, broad and moderately plump ($5\frac{1}{2}\text{--}6\frac{1}{2} \times 1\frac{1}{8}\text{--}1\frac{3}{8} \times \frac{7}{16}\text{--}\frac{1}{2}$ inches), containing

4-5 seeds per pod. Shape flat, long oval, in cross-section, moderately straight, somewhat curved, and twisted, straight backed, quite regular, not crowded, smooth, filled to the tip but not to the edge, and rounded at the end. Spur short, thick, and straight. Suture, placental is flat, possibly somewhat rounded and carpellary, acute.

Seeds large, $2.3 \times 1.5 \times .7$ cm. (20-25 per oz.); broad oblong, somewhat sub-reniform, flat, elliptical thru cross-section; ends quite uniformly rounded. Hilum medium, slightly protuberant, incurved. Color dull white, occasionally tinged with pale green quite distinctly marked with dull dun colored, converging lines. Surface moderately smooth. Quality excellent.

Henderson's Ideal. Refs. 48, 91. Syns. Buist's Mammoth Podded Ideal, Ideal, Ideal Giant. This variety originated as an improved selection of Large White. It was developed by Henderson and introduced by that company in 1906. Ideal is not an extra early selection of Large White, but it achieved its position of importance when it was first introduced because of its greater productiveness. Although it is still considered a valuable and desirable bean, it is no better, and not consistently different from the better strains of its group. It greatly resembles King of the Garden, and Jarvis suggested that it probably is an improved strain of that variety. It differs in being more vigorous, slightly earlier, and occasionally more productive. In our trials, it was very similar to Extra Early Jersey in plant and foliage characteristics. At Geneva, Ideal came into production in 100 days, 1 day later than Jersey and 2 days earlier than King of the Garden.

Plant large, 5-8 feet, vigorous climber, very productive, moderately long season. Stems thick, much branched. Foliage moderately abundant, medium to dark green with little if any gray, light veined, smooth to very slightly pubescent, medium thick and leathery. Leaflets moderately large, long and tapering ($2\frac{1}{2}\text{--}2\frac{5}{8} \times 4\frac{1}{4}\text{--}4\frac{5}{8}$ inches). Petioles moderately long. Flowers white, peduncles long and semi-limber.

Pods dark green in color. Size moderately long, broad, and medium slender ($5\text{--}5\frac{1}{2} \times 1\frac{1}{4}\text{--}1\frac{5}{16} \times \frac{1}{2}\text{--}\frac{9}{16}$ inches), containing 3-4 seeds per pod. Shape flat, long, moderately broad oval, curved at tip end, straight backed, fairly regular, not crowded, smooth, moderately filled to the tip and edge and abruptly rounded at the end. Spur short, thick and straight. Suture, placental is flat and carpellary, moderately obtuse.

Seeds large, $2.0 \times 1.3 \times .55$ cm. (22 per oz.); nearly semicircular to very broad sub-reniform, flattened, elliptical in cross-section; ends uniformly rounded. Hilum large, flat and slightly incurved. Color dull white, some tinged with pale green over the entire surface, marked with indistinct, converging, darker shaded lines from the hilum to the dorsal margin. Surface comparatively smooth. Quality excellent.

King of the Garden. Refs. 8, 9, 10, 36, 41, 48, 59, 77, 79, 91. Syns. Buckbee's King of the Garden, Garden King, Platt's Improved, Platt King Lima, Platt's King of the Garden, Schwill's Monstrous Pole. This variety was developed from Large White through constant selection for 5- and 6-seeded pods. It was introduced by Frank S. Platt in 1883. Like many varieties which have been associated with the trade for a long time, its name has been used in connection with seed stock of inferior varieties and strains. Consequently, all seed on the market called King of the Garden cannot be said to represent the superior and outstanding variety as originally selected.

In season, King of the Garden matured in 102 days, the same as Carpenteria and Seiberts, 2 days earlier than

Ford's Mammoth, and 5 days later than Small White. King of the Garden is more like Large White and Ideal than others, differing chiefly in later season and larger vine and leaflets. The plants and foliage are also very similar to Dreer.

Plant tall, climbing, 6-9 feet, 2 ft. spread at the base. Vigorous, quite heavily productive over a moderately long season. Stems thick, multibranched. Foliage abundant, medium green, dull, smooth, veins often light colored, practically no pubescence, medium thick and leathery. Leaflets large, quite long, $2\frac{3}{4}$ - $2\frac{7}{8}$ x $5\frac{1}{8}$ - $5\frac{1}{4}$ inches. Flowers white.

Pods medium light green in color, size long, broad and quite slender ($6\frac{1}{2}$ - 7 x $1\frac{1}{8}$ - $1\frac{3}{8}$ x $\frac{5}{16}$ - $\frac{3}{8}$ inches), containing 5-6 seeds per pod. Shape flat, long narrow oval in cross-section, slightly curved, sometimes twisted, saddle-backed, somewhat constricted and distorted, not crowded, moderately smooth, not filled to the tip or the edge and gently rounded at the end. Spur absent or extremely short, stout and straight. Suture, placental is rounded and slightly indented and carpellary, moderately acute.

Seeds large, 2.0 x 1.4 x $.55$ cm. (25 per oz.); nearly semi-circular, broad reniform, flat, elliptical thru cross-section; ends uniformly rounded. Hilum medium, slightly incurved. Color dull white, occasionally tinged with pale green, quite distinctly marked with converging lines from the hilum to the dorsum margin. Surface somewhat wrinkled. Quality excellent.

Large White. Refs. 8, 9, 12, 13, 15, 24, 29, 41, 48, 57, 59, 63, 91, 94, 97, 98. Syns. Butter, Common Lima, Haricot de Lima, Large Flat, Large Lima, May's Champion. This variety is probably the progenitor of all the large-seeded limas, both pole and dwarf. Undoubtedly, the variety as grown today is somewhat different from what it was a hundred years or more ago. This has been due, of course, to the constant selection practiced by interested parties in order to compete more successfully with other varieties similar to it. The earliest positive evidence that we have relative to its introduction is the fact that J. M. Thorburn & Co. listed the variety as early as 1882. Large White still retains an important position among the leading varieties of its type. It is eclipsed, however, by King of the Garden, Leviathan, and Seiberts. It must be considered too late for use in the extreme northern portion of the states. At Geneva, however, it matured the same as King of the Garden, 102 days. In many instances the variety is being replaced by Seiberts, especially in the north.

Plant large, rarely more than 8-10 feet, moderately vigorous climber, quite productive, season moderately long, same as Garden King. Stems thick, multi-branched. Foliage moderately abundant, medium to dull dark green, very smooth, practically non-pubescent, thick and fairly leathery. Leaflets moderately large, tapering (4 x $2\frac{1}{2}$ - $2\frac{3}{4}$ inches). Petioles medium long. Flowers white. Peduncles long, semi-limber.

Pods moderately light green in color; size long, broad and fairly slender (5 - $5\frac{1}{2}$ x $1\frac{1}{4}$ x $\frac{1}{16}$ - $\frac{1}{2}$ inches), containing 3-4 seeds per pod. Shape flat, long oval in cross-section, moderately curved, occasionally twisted, straight backed, quite regular, not crowded, rather rough, filled to the tip but not to the edge, and abruptly rounded to square on the end. Spur absent or very short, stout and stiff. Suture, placental is flat to slightly indented and carpellary, acute.

Seeds large, 2.5 x 1.6 x $.6$ cm. (25 per oz.); oblong, nearly semi-circular to broad reniform, flat, elliptical thru cross-section; ends uniformly rounded. Hilum large, flattened and incurved. Color dull white tinged with light green, indistinctly marked with

converging lines from the hilum to the dorsal margin. Surface moderately smooth. Quality good.

Leviathan. Refs. 48, 77, 91. Syns. Early Leviathan, Henderson's Leviathan. This large-seeded sort originated in Bergen County, N. J., and was introduced by Henderson in 1900. Jarvis suggested that it might be a selection from Seibert because the two varieties are quite similar in many characters. When first introduced it was considered by far the earliest large-seeded lima on the market. At Geneva, in recent years this has been found to be true only to a moderate degree since Leviathan produced edible seeds in 101 days, earlier by not more than 1 or 2 days than Carpenteria, King of the Garden, and Seiberts. Ideal proved to be 1 day earlier than Leviathan. It is quite similar to Seibert, with larger, straighter pods, less inclined to curl and twist. It may also be compared to Ideal as having smaller seeds, more narrow pods, and less vigorous and productive vines.

Plant moderately large, 5-8 feet, climbing. Quite vigorous, hardy, fairly productive. Stems thick; multi-branched. Foliage abundant, medium light dull green with small amount of gray color present, veins decidedly light veined, smooth, practically free from pubescence, medium thick and quite leathery. Leaflets medium large and broad (4 - $4\frac{1}{4}$ x $2\frac{3}{4}$ - $2\frac{5}{8}$ inches). Petioles medium long. Flowers white, peduncle long, semi-limber.

Pods medium light green in color; size moderately long fairly broad and slender ($4\frac{1}{2}$ - 5 x $1\frac{1}{8}$ x $\frac{3}{8}$ inches), containing 3-4 seeds per pod. Shape flat, long oval in cross-section, straight but slightly curved at tip end, straight backed, quite regular, not crowded, smooth, filled to the tip but not to the edge, and quite abruptly rounded at the end. Spur very short, moderately stout and straight. Suture, placental is flat to slightly rounded and carpellary, acute.

Seeds large, 2.3 x 1.5 x $.6$ cm. (25-30 per oz.), long, broad reniform, elliptical thru cross-section, flattened; ends quite uniformly rounded. Hilum medium, flat and incurved. Color dull white, occasionally tinged with pale green; quite distinctly marked with converging lines from the hilum to the dorsal margin. Surface moderately smooth. Quality excellent.

Red Lima. Refs. 98. This variety is not grown today and there is little if any evidence to show that it was ever grown as a commercial sort. The first record that we have of its appearance is in an article in the *Country Gentleman*, Vol. 23, p. 47, 1864, in which the following is written: "Red Lima bean — Productive; does not grow very tall; bean thinner than Large White Lima." Burr does not mention this variety in his book written one year previous. It was grown in trials at Geneva in 1884 at which time it was reported to be identical to Large White Lima with the exception of the seed color which was a deep dark red. The variety should not be confused with the Scarlet Lima mentioned in connection with Monstrous Lima — grouped in this monograph as a bush. This appeared at the same time, but was of unknown origin. These varieties are mentioned not because of their economic importance today, but for the historical interest, thereby suggesting a possible origin for some of the mottled and colored strains of lima beans.

Salem. Refs. 8, 24, 41, 48, 91. Syns. Salem Improved, Salem Mammoth, Stokes Evergreen. The variety originated in Salem County, N. J., as a selection of Large White. It was listed by Johnson & Stokes as

early as 1882 and undoubtedly was introduced by that firm on or before that time. When the variety was quite new it had the reputation of having foliage uniformly light green and pods almost twice the size of the ordinary lima. The present-day stock, however, does not approach either ideal to any reasonable extent. It is quite productive and medium early, yet today the variety is very seldom listed by American seedsmen. At Geneva, it produced edible seeds in 102 days, the same as *Carpenteria*, *King of the Garden*, and *Seibert's*, 3 days later than *Early Jersey*, and 4 days earlier than *Sunnybrook*. The variety is most like *Large White*, differing chiefly in having larger, wider pods and slightly larger seeds that are occasionally inclined to be tinged with green. Foliage very similar to *Challenger* type.

Plant large, climbing 5-8 feet, with a spread of 24-36 inches at the base. Vigorous, heavy producer over a moderately long bearing season. Thick stemmed, multi-branched. Foliage abundant, medium dull green with greyish tinge, veins often lightened, smooth, very slightly pubescent, medium thick and leathery. Leaflets medium large, broad ($4\frac{5}{8}$ - $4\frac{3}{4}$ x $3\frac{1}{8}$ inches). Petioles moderately long. Flowers white. Peduncles long, moderately stiff.

Pods moderately dark green in color. Sizes moderately long, quite broad and rather slender ($4\frac{1}{2}$ x $1\frac{1}{4}$ - $1\frac{1}{2}$ x $\frac{3}{8}$ inches), containing 3-4 seeds per pod. Shape flat, oblong-ovate in cross-section, moderately curved, saddle-backed, fairly regular, not crowded, smooth, filled to the tip but not to the edge, and abruptly rounded at the end. Spur usually absent or very short, stout and straight. Suture, placental is rounded and carpellary, acute.

Seeds large, $21.1 \times 1.45 \times .5$ cm. (25 per oz.); long, broad reniform to nearly semicircular, flat, elliptical in cross-section; ends rounded, one slightly larger, broader than the other. Hilum medium, flat and incurved. Color dull white, occasionally tinged with pale green, quite distinctly marked with converging lines from the hilum to the dorsal margin. Surface moderately smooth; quality excellent.

Seibert's. Refs. 24, 41, 48, 88, 91. Syns. *Seibert's* Early, *Seibert's* Extra Early, *Skillman's* Pole Lima, *Truckers* Delight, *Wilkey's* Perfection Prize. This variety originated with a Mr. Seibert and was considered by some to be a large-podded strain of *Jersey*. It was introduced by D. M. Ferry & Co. in 1895. It has been and still is a leading pole lima. *Seibert's* as grown today has been recommended for home, market gardens, and canning alike. At Geneva the variety produced edible seeds in 102 days, the same as *Carpenteria*, *King of the Garden*, and *Salem*, 13 days later than *Jersey*, and 4 days earlier than *Sunnybrook*. *Seibert's* is mostly like *Extra Early Jersey*, being slightly later in season and having slightly larger pods that are inclined to twist from side to side. It is slightly larger seeded and more productive than *Leviathan*. It is also not unlike *King of the Garden* in plant and foliage, possibly a trifle darker with leaflets perhaps smaller.

Plant large, climbing, 5-8 feet or better with a spread of 24-30 inches at the base, vigorous, very productive over a moderately long season. Stems thick, multi-branched, both medial and basal in position. Foliage abundant, medium to dark green, occasionally light green, smooth, light veined, very slightly pubescent, medium thick and leathery. Leaflets medium size, moderately long in proportion to width at the base ($4\frac{1}{8}$ x $2\frac{1}{2}$ inches). Petioles medium long. Flowers white, peduncles long, semi-limber.

Pods dark green in color. Size long, broad, and quite plump ($4\frac{1}{2}$ - $5\frac{1}{2}$ x $1\frac{1}{8}$ - $1\frac{3}{8}$ x $\frac{7}{16}$ - $\frac{1}{2}$ inches), containing 4 seeds per pod.

Shape moderately flat, fairly broad oval in cross-section, slightly curved, somewhat twisted, straight backed, fairly regular, not crowded, smooth, filled to the tip but not to the edge and rounded on the end. Spur very short, extremely stout and straight. Suture, placental is flattened and carpellary, moderately obtuse.

Seeds large, $2.3 \times 1.5 \times .5$ cm. (24 per oz.), long broad, sub-reniform, to nearly semicircular, flattened, elliptical thru cross-section; ends quite uniformly rounded. Hilum medium, flat. Color dull white, usually tinged with pale green and very distinctly marked with dull grayish, converging lines from the hilum to the dorsal margin. Surface usually quite smooth. Quality excellent.

Small White. Refs. 8, 9, 12, 13, 15, 24, 29, 48, 63, 91, 93, 97, 98. Syns. *Bushel Beans*, *Butter*, *Carolina*, *Carolina Sewee*, *Frost*, *Saba*, *Sieva*, *Sivy*, *Sky*, *West Indian*, *White*. This lima represents both a type and a variety within a type. It is of South American origin but apparently was grown by the Indians of the northern continent for several centuries before the white man came. Its long historical background undoubtedly accounts for the many names associated with the type. It was listed by Thorburn as early as 1822 and undoubtedly by others still earlier of which we have no record. It is offered today by a large proportion of American seedsmen, especially in the South. This variety has a distinct and important place in the crop schedule of southern growers, chiefly because of its extreme earliness. Although *Small White* is the earliest pole lima grown, it cannot be considered the most desirable since other varieties have better quality and, in the case of the potato-seeded types, greater yields. The small size of the seed and pod has been a decided handicap to the variety. It is extensively planted in the South, comparing as favorably with pole limas as *Henderson's* *Bush* does with the dwarfs.

At Geneva, *Small White* came into production in 97 days, the same as *Florida Butter*, 4 days earlier than *Willow Leaf*, and 5 days earlier than *Carpenteria*. It is very much like *Wood's* *Improved*, differing chiefly in being earlier and in having smaller vine and pod, the latter being much straighter and free from twisting. The pods are also slightly larger than *Henderson Bush*, but the foliage is very similar.

Plant large, tall; vigorous climber, 10-12 feet, with a spread of 21-24 inches at the base, moderately productive, early. Slender stemmed, quite green, multi-branched. Foliage abundant, very dark glossy green, small, stiff, light veined, pubescence absent, medium thick, not very leathery. Leaflets small, quite broad, not long, nearly top-shaped ($3\frac{1}{4}$ - $3\frac{3}{4}$ x $2\frac{5}{8}$ inches). Petioles moderately short. Flowers abundant, white. Peduncles long, limber.

Pods moderately light green in color. Size short, moderately broad, and slender ($3\frac{1}{2}$ x $\frac{11}{16}$ - $\frac{13}{16}$ x $\frac{5}{16}$ - $\frac{3}{8}$ inches), containing 3 seeds per pod. Shape flat, moderately long oval in cross-section, straight, but slightly curved at the tip, straight backed, fairly regular, quite crowded, smooth, filled to the tip but not to the edge and rounded at the end. Spur short, slender, and straight. Suture, placental is flattened and carpellary, acute.

Seeds small, $1.5 \times 1.0 \times .45$ cm. (78-80 per oz.). Shape somewhat triangular, flattened, elliptical thru cross-section; ends, one somewhat larger and broader than the other, both rounded, but the small end more abruptly. Hilum medium, flat and comparatively straight. Color chalky white, quite distinctly marked with converging veinlike lines from the hilum to the dorsal surface and also with a very narrow, indistinct, pale yellowish eye-ring. Surface moderately smooth. Quality fair to good.

Sunnybrook. This variety, one of the later selec-



FLORIDA
SPECKLED
BUTTER

GIANT

CHRIS SIMONS LARGE PODDED

POTATO

WILDER

EARLY
SMALL
SIEVA POLE

tions of the large-seeded limas, was originated by a private grower of the W. Atlee Burpee Seed Company as a selection from a variety then known as Parker Pole. It was introduced by the above-named company in 1922, but as yet is listed by comparatively few seedsmen. Sunnybrook as grown at Geneva was not earlier than the established varieties of its type, in fact one test gave it the latest maturing date of all. It produced on the average edible seeds in about 102 days, the same as *Carpenteria* and *Seibert's*, 2 days earlier than *Ford's Mammoth*, and 5 days later than *Small White*. In plant characteristics, the variety is similar to *Challenger*, with foliage about the same in size and shape but lighter green in color with very little if any gray. Pods are nearly the same size as *King of the Garden*, similarly marked along the margins, slightly more curved and usually a little earlier in season.

Plant large, 8–10 feet, climbing, quite vigorous, productive over a moderately long season. Foliage abundant, light green, no grayish tinge, smooth or very slightly pubescent, medium thick and leathery. Leaflets medium large ($4-4\frac{1}{8} \times 2\frac{1}{2}$ inches); petiole moderately long. Flowers numerous, borne on long flower spikes, white.

Pods light green in color. Size long, broad and quite slender ($7-8\frac{1}{2} \times 1\frac{1}{4} \times \frac{1}{4}$ inches), containing 4–5 seeds per pod. Shape flat, long oval thru cross-section, slightly curved and twisted, straight backed, quite regular, fairly crowded, moderately smooth, filled to the tip but not to the edge and tapering at the end. Spur very short, thick and straight. Suture, placental is somewhat rounded and carpellary, acute.

Seeds large, $2.1 \times 1.3 \times .8$ cm. (27 seeds per oz.); shape broad oblong, nearly semicircular, inclined to be somewhat twisted occasionally, elliptical thru cross-section, moderately plump ends, moderately well rounded. Color dull dirty white, very distinctly marked with a converging veinlike pattern which is often raised, giving the surface a rather wrinkled or rough appearance. Quality good.

Willow-leaved. Refs. 8, 9, 18, 24, 48, 91. Syns. Southern Willow-leaved Seivee Pole Lima. This unique lima originated as a sport of the Carolina type found growing wild in the South. It was introduced by Burpee in 1891, but later this honor was also claimed by Richard Frotscher, a seedsman of New Orleans, La., the predecessor of the Steckler Seed Company. The later organization used the variety name that appears above under the heading of synonyms. The Burpee introduction is, however, generally conceded to be more correct. The variety today is little known or planted. It is chiefly confined to the southern states, where its use is both culinary and ornamental. Because of its superior productiveness, it still is used by some growers, yet many consider its quality sadly inferior to others of the same size. It is considered an attractive ornamental vine and may be favorably compared to the bush type in this respect. The main attraction is undoubtedly the linear lanceolate or willow-leaf shaped leaves, although its fecundity is also considered an attractive feature. At Geneva edible seeds were produced in 101 days, 4 days later than *Small White* and 1 day earlier than most of the large-seeded types. It may be best compared to *Small White Lima*, differing in being several days later in season, with decidedly longer and narrower pods, and somewhat smaller in vine. At Geneva it was also found

to be less productive, although this characteristic seemed to vary in tests extending over a number of years.

Plant large, 8–10 feet with a spread of 18–24 inches at the base, vigorous, moderately productive over a long period. Stem slender, many, semi-limber branches, both medial and apical in position. Foliage abundant, very dark glossy green, smooth, light veined, no pubescence, medium thick. Leaflets long and narrow, linear-lanceolate ($5-5\frac{1}{2} \times \frac{3}{4}$ inches); petioles long, slender. Flowers numerous, small, white. Peduncle long and rather limber.

Pods very dark green in color. Size short, moderately broad and slender ($3-3\frac{1}{8} \times \frac{3}{4}-1\frac{1}{8} \times \frac{5}{16}$ inches), containing 3 seeds per pod. Shape flat, long, slender oval in cross-section, straight to occasionally slightly curved, straight backed, slightly constricted, not crowded, smooth, filled to the tip but not to the edge and abruptly rounded to square on the end. Spur short, moderately slender, and straight. Suture, placental is flattened and carpellary, acute.

Seeds small, $1.3 \times .9 \times .5$ cm. (90–95 per oz.). Shape inclined to be somewhat triangular, elliptical thru cross-section, flat, occasionally moderately protuberant. Color chalky white, rather indistinctly marked with converging veinlike pattern and also with a very narrow yellowish eye-ring. Surface quite smooth. Quality fair to good.

Wood's Improved. Refs. 41, 48, 91. Syns. King's Improved, Nichol's Medium Butter Pole Lima. This variety was introduced by T. W. Wood Seed Co., and has been listed by that company at least since 1893. Although the variety has been listed for a considerable period by a few seedsmen, it never has been widely listed. At Geneva *Wood's Improved* came into bearing in 99 days, 2 days later than *Small White* and 2 days earlier than *Willow Leaf*. *Wood's Improved* is of the *Sieva* or *Small White* type. Compared to this variety it was originally larger in pod and leaf and slightly later in season, although the first part of the statement cannot be said to be true with the present stock as grown at Geneva. As with other varieties, this one has become so intermingled that the same stocks have been sold under different names at various times and by various seedsmen.

Plant large, climbing 8–10 feet with a spread at the base of 24–30 inches. Vigorous, quite heavily productive over a moderately long season. Slender stemmed, multi-branched, both medial and apical. Foliage abundant, dark glossy green, smooth, pubescence absent, light veined, thick and leathery. Leaflets small, wide and short, $3\frac{3}{8}-3\frac{1}{2} \times 2\frac{1}{4}$ inches; short tips, petiole medium long. Flowers numerous, white; peduncle long, semi-limber.

Pods moderately light green in color. Size medium long, broad and slender ($3\frac{1}{4}-3\frac{1}{2} \times \frac{7}{8}-1\frac{5}{8} \times \frac{5}{8}$ inches), containing 3–4 seeds per pod. Shape flat, long slender oval thru cross-section, moderately straight, occasionally curled, straight backed, regular, fairly crowded, smooth, filled to the tip but not to the edge, and uniformly rounded at the end. Spur short, slender and straight. Suture, placental flattened and carpellary, acute.

Seeds medium, $1.8 \times 1.1 \times .5$ cm. (45–50 per oz.). Shape inclined to be somewhat triangular, altho occasionally some are nearly semicircular, longer and broader than *Small White*, elliptical to long oval in cross-section; ends one wider and either quite square or more uniformly rounded than the other. Hilum medium, flat. Color dull white, marked with a converging, veinlike pattern from the hilum to the dorsal margin. Surface moderately smooth. Quality fair to good.

DWARF VARIETIES

Burpee. Refs. 1, 2, 7, 9, 17, 24, 25, 29, 39, 40, 41, 47, 48, 49, 50, 62, 77, 91. Syns. Burpee's Bush, Burpee's Large Bush, Crenshaw Large White, Don Bush Lima, Elliott's Bush, Large White Bush, Mammoth Bush,

True Bush, Willets Bush. This variety was said to have originated in 1883 at which time the finder, Ashur Palmer of Kennett Square, Pa., claimed to have found it as a single dwarf plant in a field of the Large White pole limas. Prompted very largely by the growing interest in the development of the dwarf type of the standard pole lima, Mr. Palmer brought his selection to W. Atlee Burpee, who after due care and selection increased the amount of stock seed and introduced the variety in 1890. Naturally, the supply was quite limited, thereby necessitating its distribution in rather small amounts which were sold at the attractive price of 75 cents per four beans. The Burpee was the first true large lima developed and should not be confused with Henderson which belongs to the small Carolina Sieva or Sewee group, or to the Kumerle or Dreer type, commonly known as the Potato lima.

This variety has been and still is considered one of the leading bush limas. It is surpassed in its group only by the so-called improved strain introduced in 1907 by Burpee as Improved Burpee. It is very productive, with high quality, large, attractive seeds. As to season, it may be considered too late to be used in the northern states for a full crop. At this Station it required 86 days to mature a crop, 3 days later than Henderson and 1 day earlier than Philadelphia. In plant characteristics it is more like Wonder than any other, being less bushy and more straggling in growth; pods slightly smaller and seeds somewhat broader and thinner, although the latter is not a distinctive difference.

Plant medium to large, 14–20 inches high with an equal spread; a true bush lima, altho occasionally a semi-runner type is produced; always rather scraggly in appearance. Vigorous, thick stemmed, and heavily productive. Foliage abundant, light green to occasionally dull green. Surface smooth, light veined with practically no pubescence, thick and leathery in texture; leaflets large, broadly ovate; petioles medium to long. Flowers white, turning cream color with age, borne on very long, thick stalks.

Pods borne intermediate and above the foliage; dark dull green in color. Size long, very broad and slender ($4\frac{1}{2}$ –5 x $1\frac{1}{4}$ x $\frac{3}{8}$ – $\frac{1}{8}$ inches), containing 3–4 seeds per pod. Shape decidedly flat, very long oval in cross-section, slightly curved especially near tip, straight backed, regular, altho occasionally slightly constricted, not crowded, smooth, filled to the tip and edge and abruptly rounded to truncate on the end. Spur very short, thick, stiff and sharp. Suture, placental is flattened and carpellary, acute.

Seeds large, 2.2 x 1.4 x .5 cm. (25 per oz.); oblong, broad, rather triangular, occasionally sub-reniform, slightly incurved at the hilum, very long oval thru cross-section, distinctly flattened; ends, one usually larger and broader than the other, both rounded, altho the broader end is more gradual. Hilum medium, slightly protuberant. Color dingy white marked with light grayish-brown converging vein-like lines from the hilum to the dorsal surface, greenish tinge may occur to some extent. Surface moderately wrinkled. Quality excellent.

Burpee Improved. Refs. 48, 77. Syns. Enormous, Giant Bush, Giant Improved, Improved Large Bush, New Improved, Wilson Bush. According to W. Atlee Burpee, this variety was an entirely "new creation" and not an improved selection. It was discovered in 1903 as a sport in a field of Challenger Pole limas and was introduced by the above-named seedsman in 1907. Since then, it has gradually gained in popu-

larity; and today this variety is in more demand than Burpee Bush.

In earliness, it comes between Henderson and Burpee's Bush, although very little difference, if any, exists between it and the latter. At Geneva it matures in 86 days, the same as for Burpee, 1 day earlier than Philadelphia, and 3 days later than for Henderson. The plant is somewhat more productive, and more erect with less tendency towards the scraggly growth such as Burpee manifests. The leaves and pods are slightly larger, the latter being somewhat straighter and more plump than Burpee Bush. The variety is gradually displacing the first large lima variety introduced, since it is a decided improvement over it.

Plant medium to large, 16–22 inches tall with spread somewhat less; erect and not inclined to run or produce a scraggly growth to any extent. Vigorous, thick stemmed, very prolific. Foliage abundant, dark green, almost glossy. Surface very slightly crumpled, lightly veined, with practically no pubescence; thick and leathery in texture; leaflets large ($4\frac{7}{8}$ x $3\frac{1}{4}$ inches), broadly ovate. Petioles medium to long. Flowers white, turning cream colored with age; borne on long, stout fruit stalks.

Pods borne intermediate among the foliage, medium dark green in color. Size long, broad and moderately thick ($3\frac{1}{2}$ x $1\frac{1}{4}$ x $\frac{3}{8}$ – $\frac{1}{2}$ inches), containing 4–5 seeds per pod. Shape flat, long oval thru cross-section, moderately curved, straight-backed, regular, filled to the tip but not to the edge and abruptly rounded to truncate on the end. Spur very short, thick and straight. Suture, placental is flat and carpellary, acute.

Seeds large, 2.2 x 1.5 x .8 cm. (23 per oz.), broad oblong, somewhat sub-reniform, long oval thru cross-section, fairly plump, surface rather wrinkled or marked with converging corrugations, ends rounded. Hilum small, flattened. Color pale creamy white, few with a greenish white tinge, marked with dark shaded converging lines from the hilum to the dorsal margin. Surface quite wrinkled. Quality excellent.

Dreer's Bush. Refs. 17, 29, 39, 40, 41, 48, 57, 59, 91. Syns. Challenger, Dallas, Dwarf Potato, Kumerle, Potato Bush, Salzer's Bush, Thorburn's Bush Lima. This variety was preceded by Kumerle or Thorburn Lima, which are identical. The stock of this variety originated from occasional dwarf forms of the Challenger Pole Lima from which it probably derived the name Challenger Bush, sometimes applied to it. The original stock found by J. W. Kumerle was introduced by J. M. Thorburn & Co. in 1889, two years before the variety now known as Dreer was brought before the public by Henry A. Dreer. The name Dreer has been retained and now is the most commonly used to designate the strain. It represents a type more widely known as the potato lima, having a much plumper and thicker seed than either the Henderson or the Burpee. It is reported to be especially adapted to light soils and dry seasons, of excellent quality, and often considered as a leader in productiveness, although variety tests at other stations show strains quite variable. It is probably more dependable in this respect than Burpee. At Geneva it proved to be one of the two latest bush varieties, coming into harvest in 90 days, the same as Dwarf Large White and 4 days later than Fordhook.

The plant is quite different in growth habit from other bush forms. It is much more spreading and inclined to produce more runners than Burpee. Pods



HEAVY STEMMED BUSH LIMA — ENORMOUS EARLY

(Natural size)



SLENDER STEM BUSH LIMA — DWARF SIEVA

(Natural Size)

are shorter, decidedly more plump, and thickened; seeds are thicker; leaflets more narrow, lighter colored, and apparently free from the glossy finish as suggested by Burpee.

Plant medium to large (14–20 inches), with a spread of 15–18 inches. Vigorous, stems quite stout, round. Branches large, coarse, spreading with numerous runners that bear the late crop of beans. Foliage abundant, medium grayish green in color; smooth but not glossy; light veined, very slight amount of pubescence, medium thick; leaflets long and narrow ($3\frac{1}{2}$ –6 inches), nearly lanceolate; quite distinct from Burpee. Petioles medium short. Flowers white, later turning cream colored; borne on short stalks; spikes short.

Pods borne mostly below the foliage; dark green in color. Size short, wide and plump ($2\frac{3}{4}$ – $3\frac{1}{2}$ x $1\frac{1}{8}$ x $\frac{1}{2}$ inches), containing 2–4 seeds per pod. Shape moderately flattened, long oval thru cross-section, straight, slightly humpbacked, regular altho occasionally slightly constricted, not crowded, smooth, filled to the tip and nearly to the edge and nearly truncate or square at the end. Spur very short, straight, thick, and pointed — quite inconspicuous. Suture, placental is flattened to slightly indented and carpellary, moderately obtuse.

Seeds medium, $1.8 \times 1.45 \times .8$ cm. (25 per oz.); short, broad, nearly semi-circular, long oval thru cross-section, moderately plump, ends uniformly rounded and occasionally somewhat truncate. Hilum large, flattened and occasionally incurved. Color pale creamy white, occasionally tinged with green and marked with darker shaded, converging lines from the hilum to the dorsal margin. Surface moderately wrinkled. Quality excellent.

Fordhook. Refs. 48, 77. This bush lima was discovered by Henry Fish of Santa Barbara County, Calif. He found it as a single plant sport in a field of Challenger Pole limas in 1903, incidentally at the same time he also found the original plant of Burpee Improved. Fordhook was selected and developed by the W. Atlee Burpee Seed Company and introduced in 1907. Although Fordhook is of the same type as the Dreer or the Kumerle, it is not a selection from it as generally supposed. It is, however, an improved dwarf lima of the Kumerle or Potato Bush type. The variety is generally conceded to be a heavier cropper than its type fore-runner, the Dreer. This factor, together with its comparative freedom from prostrate growth has given it an important place in the home gardener's as well as the market gardener's variety list. This characteristic has largely eliminated the pods that on the old type would have become discolored from being beaten and thrashed about by the wind and rain.

In season, Fordhook is a few days earlier than Dreer. At Geneva, it requires 86 days to maturity, 4 days earlier than Dreer and 2 days later than Henderson. This variety may best be compared to Dreer in type of plant growth. Fordhook is decidedly upright and erect and is almost entirely free from the willowy runners and limber side branches characteristic of Dreer. The foliage is heavier, leaflets somewhat broader and similar to the leaf of a large pole lima, more leathery, and thicker. Pods and seeds are inclined to be slightly larger and more plump. All of these distinct improvements readily account for the prominent position now occupied by this variety.

Plant medium tall, (16–20 inches) with a spread of 14–16 inches; upright, moderately erect, occasionally inclined to be scraggly. Vigorous, highly productive over a period of two weeks. Stem stout, fairly stiff, numerous branches both medial and basal.

Foliage abundant, dark green in color, smooth, light veined, very slight amount of pubescence, very thick and leathery; leaflets large, moderately long, $5\frac{3}{4}$ x $3\frac{3}{4}$ inches, inclined to be more broad at the base than Dreer. Petioles moderately short. Flowers white.

Pods borne mostly below the foliage; medium dark green in color. Size moderately long, broad and plump ($3\frac{1}{4}$ x $1\frac{1}{8}$ x $\frac{1}{2}$ – $\frac{5}{8}$ inches), containing 3–4 seeds per pod. Shape flat, elliptical thru cross-section, straight to slightly curved, especially from side to side, straight backed, somewhat constricted and often distorted, not crowded, fairly smooth, filled to the tip and the edge and well rounded to almost square on the end. Spur very short, thick, straight and sharp. Suture, placental is flattened and carpellary, obtuse.

Seeds large, $1.8 \times 1.5 \times .8$ cm. (21 per oz.); short, broad, nearly circular, oval thru cross-section, plump, surface somewhat wrinkled and depressed in places, uniformly rounded and occasionally truncate. Hilum large and slightly depressed. Color pale creamy white with a tinge of green (pale olive buff), indistinctly marked with converging lines from the hilum to the dorsal suture. Surface rough. Quality excellent.

Henderson. Refs. 7, 9, 17, 24, 25, 29, 35, 39, 40, 44, 46, 48, 49, 57, 59, 62, 63, 71, 77, 88, 91, 96. Syns. Dwarf Carolina, Dwarf Sieva, Earliest Bush, Kelsey Bush, Landreth's Bush Lima, Prolific Bush, Small White Bush. This variety is supposed to have had its origin about 1883 from a chance plant found growing along the road in the vicinity of Lynchburg, Virginia, by a passing negro pedestrian. It was afterwards grown by a local market gardener until 1885 when it was passed on to T. W. Wood & Sons. This firm grew it for two years and then sold the complete stock to Peter Henderson Company of New York in 1887. Henderson kept it to make further selections and to increase the stock and then offered it to the public in the spring of 1889 by the name it now bears. Henderson also introduced an improved strain of this variety in 1907. According to Tracy, however, Improved Henderson is identical with Wood's Prolific Bush Lima introduced by T. W. Wood & Sons in 1899. The latter is probably correct, inasmuch as Wood's Prolific Bush had its origin as a sport of Henderson's Bush several years before Peter Henderson introduced his "Improved Henderson."

The Henderson fills an important place in the group of dwarf limas. Because of its earliness and distinct size and color, it is greatly admired by home gardeners and canners, especially the latter who depend chiefly upon this type for their product. It is also a desirable variety because of its hardiness, productiveness, and freedom from disease, an important consideration in the production of this crop. Its dependability as a sure cropper when other varieties of other types fail because of adverse weather conditions has given it the well-deserved place that it holds. Henderson came into harvest the earliest of all varieties of lima beans, in 84 days at Geneva, 6 days earlier than Dreer and 2 days earlier than Fordhook. It is one of the two most widely grown bush limas of this type. It is earlier by several days than Wood's Prolific and is most like this variety, differing only in having slightly smaller seeds, smaller and less twisted pods, and less vigorous in general growth habit.

Plant small, 12 inches or less with a spread of not more than 15–16 inches; quite erect, bushy, almost entirely free from drooping runner-like side branches. Vigor fair to good, very early, produc-

tive over a long period. Slender stemmed, numerous short branches, both medial and basal. Foliage abundant, very dark green, glossy, smooth, lightly veined, pubescence absent or very slight, moderately thick; leaflets small and moderately broad ($3\frac{3}{4}$ – $4 \times 2\frac{5}{8}$ – $2\frac{3}{4}$ inches), petioles moderately long. Stipules small. Flowers very abundant, white, turning cream colored with age.

Pods borne mostly above plant; dark green in color. Size short, broad and slender ($2\frac{1}{2}$ – $3\frac{1}{4} \times \frac{3}{4}$ – $\frac{7}{8} \times \frac{5}{16}$ inches), containing 3–4 seeds per pod. Shape very flat, elliptical thru cross-section, slightly curved, straight backed, regular, not crowded, smooth, filled to the tip and edge and rounded at the end. Spur very short, straight and stiff. Suture, placental is flattened and carpellary, acute.

Seeds small, $1.4 \times 1.1 \times .45$ cm. (90–95 per oz.) short broad, somewhat triangular, occasionally sub-reniform, quite straight at the hilum, long flat oval thru cross-section, distinctly flattened; ends, one usually broader and more gradually rounded than the other. Hilum medium, flattened. Color pale creamy white, over entire surface, marked with converging, irregular ridge-like pattern that indicates a rather rough surface in some instances and merely resembling an under pattern in others. Quality good to excellent.

Jackson Wonder. Refs. 7, 24, 29, 41, 48, 49, 59, 62, 72, 91. Syns. Jackson, Jackson Wonder Dwarf Sieva, Nicholson's Speckled, Old Florida Bush, Stecklers Calico Bush. This variety originated with Thomas Jackson, an enterprising farmer of Atlanta, Ga. It is primarily a bean for the southern states and is supposed to be a very prolific dwarf strain of Speckled Lima or Small White. It was first introduced by D. Landreth & Sons in 1888, but three or four years later was reintroduced by several other seed houses among which were Mark W. Johnson Seed Company and the Samuel Wilson Seed House. The Jackson is the hardiest of all Bush Limas, very productive and generally possessing most of the good qualities of the small-seeded limas, but because of the seed color can never become a popular leading variety. It is often termed a combination lima bean, inasmuch as when the pods are real young they may be used as snap beans in addition to their utility as a shell bean in the usual stage.

At Geneva it was third earliest, coming into bearing in 87 days, 4 days earlier than Dreer and 3 days later than Henderson. In general plant characteristics it may be best compared with Henderson. It differs from this variety, however, in having slightly larger seeds that are irregularly spotted and streaked with dark brown to black; decidedly more spreading in habit, with a slight tendency towards running; beans longer and more nearly like the Willow-leaved lima; pods may also be considered very similar to those of the latter named variety.

Plant small to medium, 12–18 inches tall with a spread about the same or slightly larger. Quite spreading, almost sprawling growth, somewhat inclined to run. Slender-stemmed with the exception of the central stalk which is quite stout and erect; numerous semi-twining branched. Foliage medium, very dark green, glossy, smooth, lightly veined, apparently without pubescence and medium thick and leathery; leaflets small, long, almost lanceolate ($4 \times 2\frac{3}{4}$ inches), quite stiff and pointed, petioles numerous, medium short. Flowers very numerous, white.

Pods borne well above the foliage; dark green in color. Size short, broad and slender ($2\frac{3}{4}$ – $3\frac{1}{4} \times \frac{3}{4}$ – $\frac{7}{8} \times \frac{1}{4}$ – $\frac{3}{8}$ inches), containing 3–4 seeds per pod. Shape flat, long oval to elliptical thru cross-section, straight to slightly curved, straight backed, regular, fairly crowded, smooth, filled to the tip and edge and rounded at the end. Spur very short, thick, straight and stiff. Suture, placental is flattened and carpellary, acute.

Seeds small, $1.5 \times .9 \times .45$ cm. (70–75 per oz.); somewhat triangular, long oval thru cross-section, distinctly flattened; ends wide and nearly square, the other quite abruptly rounded and very narrow. Hilum medium, slightly indented. Color light buff (pale ochraceous buff) under color, mottled and splashed with varying shades of blue-violet black to purplish black over entire surface. Some seeds are almost entirely covered with the darker shades. Quality fair to good.

Monstrous. Refs. Aggeler & Musser, 1913. This large-growing bush lima originated in Orange County, Calif., and was introduced by Aggeler & Musser Seed Company of Los Angeles in 1908. Apparently it is not adapted for normal growth and development in the northern states. This is borne out by the fact that in the trials at Geneva no mature (ripe seed) pods were produced and also because the introducers suggest that its planting be limited to tropical and semi-tropical climates. The growth habit of this extraordinary bean is quite unique. At Geneva it produced numerous long, prong-like, stiff, stocky branches that if given a chance to develop under more suitable conditions would have grown into extremely long, vine-like extensions. Morris and Snow of Los Angeles report that under their conditions the vine-like branches have grown 10 to 15 feet long. The plant, therefore, should not be considered a true bush, neither is it a distinct pole, since it lacks the climbing characteristics. It may, however, be termed a very vigorous viner, quite unusual in any other variety of this species.

Plant very large, spreading, often producing long runners in suitable environment. Extremely vigorous, high yielding over a comparatively long period of time. Stem large, stout and stocky, moderately long internodes, multi-branched both basal and medial in position. Foliage moderately abundant, dark green, dull, smooth, medium thick but not very leathery or tough; leaflets moderately large, broad ($4\frac{1}{4} \times 3\frac{1}{4}$ inches), taper pointed. Flowers large, white. Peduncles medium to short. Pods large; long, very wide and thick ($7\frac{1}{2} \times 1\frac{1}{2} \times 3\frac{1}{4}$ inches), broad oval thru cross-section, usually distorted, ends rounded, tip distinctly short and thick. Seeds large, 16 to the oz., uniform, semi-circular, thick and white in color.

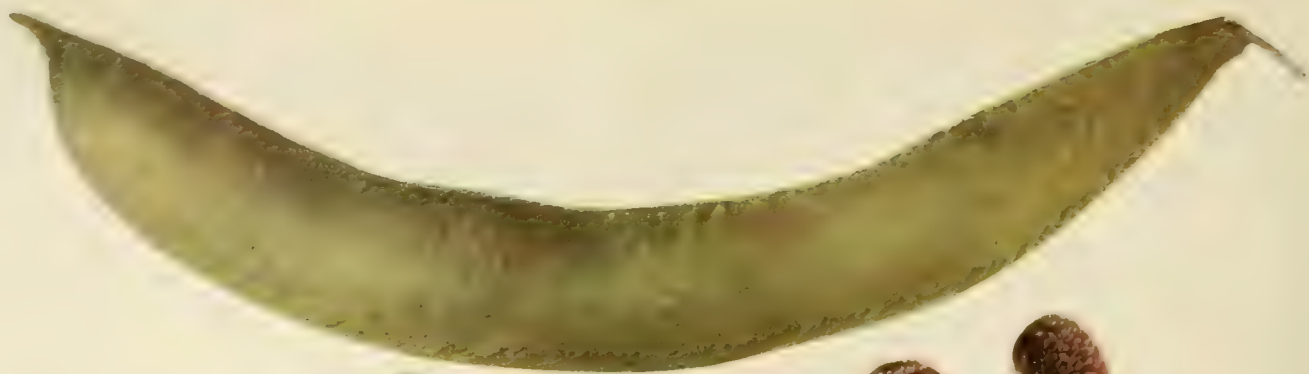
Philadelphia. Ref. W. Atlee Burpee Cat. 1924, p. 74. This variety is one of the later distinctive developments of the bush lima bean. It had its origin as the result of a cross between Fordhook and Wood's Prolific, and apparently has retained many of the good qualities characteristic of both parents. It was developed and introduced by the W. Atlee Burpee Seed Co. and marks the beginning of the introduction of improved varieties as the result of controlled crosses rather than chance sports or crosses that were formerly explained as the result of "Nature's methods."

At Geneva, this variety produced marketable beans in 88 days, 1 day later than Wood's Prolific and 2 days earlier than Dreer. According to the introducer, however, the pods mature fully as much as 7 days earlier than Wood's Prolific. In this variety the plant and foliage are very similar to Henderson Bush and Wood's Prolific. It resembles the latter especially in vigor, pods slightly larger and straighter, and containing four medium-sized beans more often than three; somewhat earlier and decidedly more productive than Dwarf Sieva.

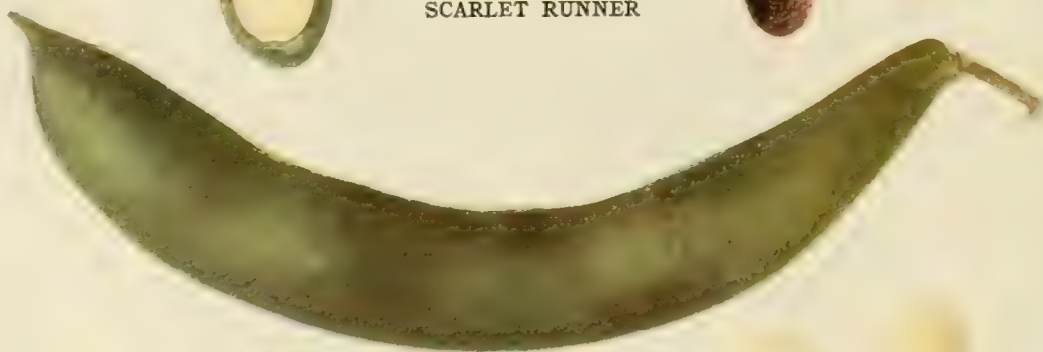


BUTTERFLY RUNNER

(Natural size)



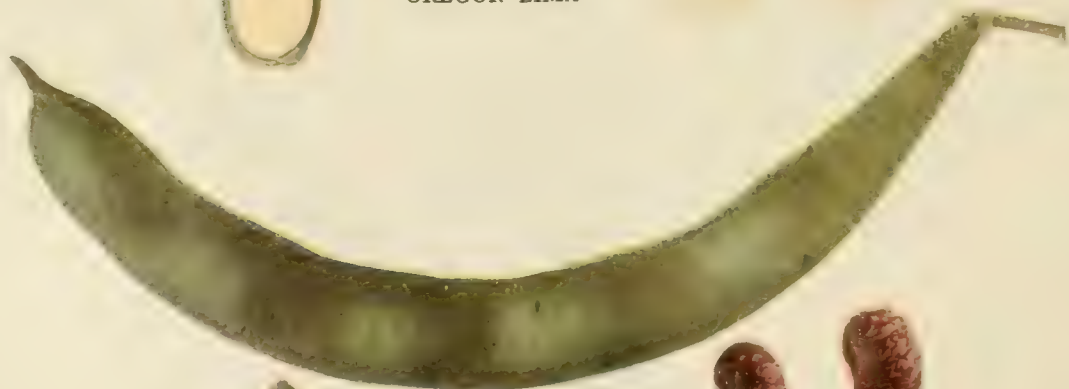
SCARLET RUNNER



WHITE DUTCH RUNNER



OREGON LIMA



BIJOU



Plant medium tall, 12–15 inches with a spread of 15–18 inches; bushy, entirely free from runners. Moderately vigorous, highly productive over a period of about two weeks. Stem moderately stout, internodes medium short. Branches fairly numerous, mostly basal in position. Foliage medium in amount, dark green, glossy, smooth, moderately thick and leathery. Leaflets medium size ($4\frac{1}{2}$ – $4\frac{3}{4}$ x $2\frac{3}{4}$ –3 inches), moderately long petioles. Flowers very numerous, white, later cream colored.

Pods borne well above the foliage except the earlier ones that are fairly close to the ground; dark green in color. Size medium long, broad and moderately slender ($3\frac{1}{2}$ – $4\frac{3}{4}$ x $1\frac{1}{8}$ x $\frac{3}{8}$ inches), containing 3–4 seeds per pod. Shape flat, long oval thru cross-section, straight, occasionally slightly curved or twisted from side to side, straight backed, regular, not crowded, smooth, filled to the tip but not as well filled to the edge as Henderson and rounded at the end. Spur very short, straight and stout. Suture, placental is flattened and carpellary, acute.

Seeds small, 1.5 x 1.0 x .5 cm. (55–60 per oz.); moderately broad oblong, nearly semicircular, flattened, long oval to elliptical thru cross-section; ends uniformly rounded. Hilum medium, flat to slightly protuberant altho the hilar surface is somewhat indented. Color clear white, indistinctly marked with converging lines from the hilum to the dorsal margin. Surface moderately smooth. Quality excellent.

Superba. This variety was introduced about 20 years ago as a selection from Burpee's Improved by Robert Buist. As grown at Geneva it was very similar to the above-mentioned variety, differing chiefly in having larger pods, although this was not a consistent difference as some years they were not uniform in either shape or size. The plants showed a tendency towards a more sprawling, spreading growth than did plants of Burpee's Improved. In season, pods were produced at Geneva in 88 days, 1 day later than Burpee's Improved and 4 days later than Henderson.

Plant medium tall, 15–18 inches with a spread somewhat greater, 18–24 inches. Inclined to produce a few runners on some plants, rather sprawling and spreading. Vigorous, moderately long producing season. Foliage abundant, medium green, with a slight grayish tinge, smooth, light colored veins, small amount of pubescence, moderately thick but not very leathery. Leaflets quite large (5 x $3\frac{3}{4}$ inches), broad. Flowers white.

Pods borne both above and below the foliage; light green in color, long, broad and thick (5 x $1\frac{1}{2}$ x $\frac{1}{2}$ inches), containing 3–4 moderately plump seeds. Shape oval thru cross-section, flat podded, slightly curved, straight backed, regular, not crowded, velvety smoothness, filled to the tip but not to the edge, rounded at the end, with a distinct tip that is short, straight and thick. Both placental and carpellary sutures are rounded.

Seeds uniformly very large (2.4 x 1.8 x $.9$ cm.), (21 per oz.) broad oblong, somewhat reniform, long oval thru cross-section, fairly plump, surface moderately smooth, occasionally marked with converging corrugations; ends rounded, altho one is slightly broader than the other. Hilum small, flattened but slightly incurved. Color pale creamy white, some inclined towards a slightly greenish tinge, indistinctly marked with dark shaded converging lines from the hilum to the dorsal margin. Quality very good.

Willow-leaved Bush. Refs. 40, 41, 48, 91. This variety originated as a sport from Willow Leaf Pole and was introduced by W. Atlee Burpee in 1900. So far as we have been able to determine, the variety has never been grown at this Station, consequently such information that is presented is the result of compilation from data gathered from other sources. The variety is especially adapted for the southern states, although favorable reports have also been received from some of the northern ones and from Canada. It has maintained the charac-

teristic of all small limas, namely, that of early bearing. The foliage is of such a type as to make it desirable, at least to some, as an ornamental. As such it is used in southern gardens as a border plant. The bush form of Willow Leaf Lima is most like Henderson. It differs chiefly in the type of foliage in that the leaflets are decidedly lanceolate, being three to four times as long as they are wide. The color is slightly lighter, pods somewhat more curved, longer, and more narrow. The dry seeds are slightly thicker and less angular. It is slightly less productive, since the bush itself is somewhat smaller. In season the two are practically the same.

Plant small, quite uniform, 10–12 inches tall; about the same spread; somewhat open and spreading but not productive of runners. Moderately vigorous for its size, heavy bearer, with a comparatively long bearing season. Stems rather slender, branches fairly numerous, mostly basal in position. Foliage moderately abundant, dark glossy green, smooth, moderately thick and leathery; leaflets small, decidedly lanceolate, occasionally some are produced that are typically Henderson in type. Petioles medium short. Flower stalks very long. Flowers numerous, white.

Pods borne prominently above the foliage; dark green in color. Size short, moderately broad and rather slender ($2\frac{7}{8}$ –3 x $\frac{3}{4}$ – $\frac{1}{2}$ x $\frac{1}{4}$ – $\frac{5}{16}$ inches), containing 3–4 seeds per pod. Shape flat, elliptical in cross-section, straight backed, regular, fairly crowded, smooth, filled to the tip but not to the edge and rounded at the end. Spur very short, moderately stout, straight and sharp. Suture, placental is flattened to slightly rounded and carpellary, acute.

Seeds small, 1.35 x .9 x .4 cm. (90–95 per oz.); nearly triangular, decidedly flattened, elliptical thru cross-section; one end wider and more uniformly rounded than the other, thereby suggesting the triangular appearance. Hilum medium, flattened. Color dull solid white over the entire surface and indistinctly marked with converging dark shaded lines radiating from the hilum to the dorsal margin. Surface moderately smooth. Quality fair to good.

Wonder. Refs. 24, 41, 48, 72, 91. Syns. Dreer's Large Bush, Dreer's Wonder, New Wonder. This large bush variety originated as a selection of Burpee's Bush Lima and was introduced to the trade in 1898 by Henry A. Dreer. In 1901, Burpee offered another selection of Burpee's Bush which he called Quarter Century. Although these two seed stocks are undoubtedly very similar, they are not of the same source, inasmuch as the first was found by a Long Island grower and introduced by Dreer in 1898 and the second by a California grower and introduced by Burpee in 1901. Wonder undoubtedly was intended to satisfy the demand for an earlier strain of the Large Burpee. The introducer suggested that it was as much as 10 to 15 days earlier than Burpee's Bush. At Geneva, this has not been found to be true. It has also been reported that, although it was somewhat earlier, the quality when young was inferior, thereby suggesting that its reported earliness was illusory. At this Station it required 86 days to mature, just 1 day earlier than Burpee's Bush and 2 days later than Henderson. No doubt under more favorable growing conditions than are obtained in the northern states, the variety would be a great improvement over its parent. Although predicted 25 years ago to replace largely the Burpee and Improved Burpee, today it is only listed by a very few seedsmen. The Wonder differs chiefly from Burpee's Bush in being more bushy, more compact in habit, and almost entirely free

from runners. Pods and seeds are very similar and under some conditions are slightly larger.

Plant moderately large, 15-20 inches tall with a spread of 18-24 inches, quite bushy and stocky. Vigorous, heavily productive, and moderately long in bearing. Stems stout with moderately short internodes, branches numerous, mostly basal in position. Foliage abundant, dark dull green, smooth, lightly veined, very slightly pubescent, thick and leathery; leaflets large, $4\frac{7}{8}$ -5 x $3\frac{1}{4}$ - $3\frac{1}{2}$ inches, very broad. Petioles moderately long. Flowers white, later turning cream colored. Peduncle rigid, medium long.

Pods borne intermediate among the foliage; dark green in color. Size long, broad and slender ($4\frac{1}{2}$ x $1\frac{1}{8}$ x $\frac{3}{8}$ inches), containing 3 seeds per pod. Shape flat, long oval thru cross-section, uniformly curved, straight backed, constricted, seeds fairly close together smooth, filled to the tip but not to the edge and rounded to square on the end. Spur not prominent, very short, stout, and straight. Suture, placental is flattened, and carpellary, acute.

Seeds large, 2.2 x 1.5 x .45 cm. (30 per oz.); long broad, semi-circular, extremely flat, elliptical in cross-section; ends uniformly rounded. Hilum medium, flattened to slightly indented. Color white, with a greenish tinge in some instances, marked with a very distinct dark shaded, raised converging lines from the hilum to the dorsal margin. Surface quite rough. Quality excellent.

Wonderful. This variety should not be confused with Wonder, a very different type of bush lima. It was introduced in 1910 by Simon who said that it was an improved selected strain of Fordhook. In shape and size of pods and seeds the two are very similar. When introduced, however, the pods were supposed to be larger and broader than Fordhook, but at Geneva little of any difference existed between the two strains. It differs from Fordhook mainly in having a trifle larger seed that retains more of the green pigment when dry. The leaflets of Wonderful are shorter and broader, being about 5 inches long and $3\frac{3}{8}$ to $3\frac{1}{2}$ inches wide at the base. The pods are borne well off the ground. The seeds are decidedly green when shelled. It has the same season as Fordhook, and is quite prolific.

Wood's Prolific. Refs. 41, 48, 91. Syns. Henderson's Improved Bush Lima, King's Improved Bush Lima, Prolific Bush Lima, St. Louis Seed Co.'s Improved Bush Lima, Tuckers Prolific Bush Lima, Wood's Bush. This strain of Henderson's Bush was obtained from a farmer near Richmond, Va., who stated that it was a sport from the latter variety. It was obtained and introduced by T. W. Wood, the originator of the Henderson, in 1899. It was meant to serve as a variety similar to Henderson, but with a larger pod and seed, together with increased vigor and quality. These factors were achieved to a moderate degree. The new selection, however, did not retain the earliness of Henderson. In the field the plants of Henderson and Wood's Prolific look almost identical. They differ in that Wood's Prolific is more vigorous, has larger plant, with slightly larger leaves, and possesses a greater spread. Pods are very similar but are slightly larger and less filled to the edge than Henderson. The seeds in the green-shell stage, at least, are a trifle larger. At Geneva, it required 87 days to reach maturity, 3 days later than Henderson's and 3 days earlier than Dreer's Bush.

Plant medium size, 12-15 inches tall with a spread of 15-18 inches. Quite erect, bushy, entirely free from runners. Quite

vigorous, intermediate in season, productive over a moderately long period. Inclined to be slender stemmed with numerous short branches both basal and medial in position. Foliage abundant, very dark, glossy green, smooth, lightly veined, pubescence absent or very slight, moderately thick; leaflets small to medium ($4\frac{1}{4}$ x $4\frac{3}{4}$ - $2\frac{7}{8}$ inches), petioles moderately long. Flowers white, numerous. Peduncles moderately short and rigid.

Pods borne well above the foliage, dark green in color. Size moderately long, broad and quite slender ($3\frac{1}{2}$ -4 x $\frac{3}{4}$ - $\frac{7}{8}$ x $\frac{3}{8}$ inches), containing 3-4 seeds per pod. Shape flat, elliptical in cross-section, fairly straight altho there is a tendency for the pod to twist from side to side, straight backed, moderately constricted, fairly crowded, smooth, filled to the tip but not to the edge and square at the end. Spur short, straight and moderately slender.

Seeds small to medium, 1.7 x 1.2 x .5 cm. (60-65 per oz.); somewhat triangular, occasionally broad sub-reniform, elliptical thru cross-section, flat to moderately plump altho not approaching the potato type in this respect; one end usually wider and more evenly rounded than the other. Hilum small and flattened but hilar surface slightly incurved. Color pale creamy white over entire surface, marked with a converging, slightly raised, radiating lines from the hilum to the dorsal margin that suggests a surface that is moderately rough. Quality fair to good.

THE RUNNER BEANS

This group, known more widely as flowering beans and botanically as *Phaseolus coccineus*, represents a class that is of comparatively minor importance in this country, yet of sufficient popularity in England to justify the presence of a moderately large number of varieties. It is not the purpose of this monograph to report a complete varietal test of this group, neither does it suit our purpose to ignore the species completely. An attempt has been made to point out the leading variety types with as complete descriptions as possible, and to qualify these with minor accounts of such varieties that are merely of historical interest.

The group as a whole is believed to be a native of South America. It is naturally a perennial, but under cultivated conditions of the more temperate climates it is an annual. This group of plants, while of some importance as a vegetable crop, is more esteemed as ornamental climbers on account of their rapid growth and the production of an abundance of large, often brightly colored flowers. Irish more completely describes the group as follows:

"Plant twining, 10-15 feet high, minutely pubescent, in warm weather perennial with tuberous rootstocks, with us, annual and with branchy roots; stems slender. Leaflets broadly ovate or obliquely ovate, acuminate, inclining to triangular, 3-4 inches long, $2\frac{1}{2}$ - $3\frac{1}{2}$ inches broad, quite smooth. Blossoms showy, in racemes longer than leaves, white, scarlet or variegated in different garden varieties. Pods green, oblong, cylindric, varying very much in length, straight or little curved, scabrous, tipped with short stout spur. Seed large, $\frac{3}{4}$ - $1\frac{1}{4}$ inch long, $\frac{3}{8}$ - $\frac{5}{8}$ inch broad, $\frac{1}{4}$ - $\frac{3}{8}$ inch thick, a little turned, variously colored. The cotyledons remain below ground when the seed germinates."

Arabian Runner. This variety is of unknown origin. The term Arabian seems to be applied to several varieties of flowering beans, often with a modification which connects it with a particular variety. Available references are too meager, however, to establish definitely very much about either the history or accurate description. In the annual report of the United States Commissioner of Agriculture in 1865, the names Arabian



SCARLET RUNNER

Natural size



JUBILEE RUNNER

(Natural size)

White Flowered and Arabian Colored Runner appear. Later, in its 1909 catalog, the Iowa Seed Company lists Arabian Runner as similar to Scarlet Runner with white flowers striped with scarlet. This description does not, so far as is known, apply to any other known variety. The bi-color types have different solid-colored keels and wings, but they do not show the striped effect mentioned above.

Aroostook Bush Lima. Refs. 48, 91. Syns. *Aroostook Multiflora*. This variety was introduced by George W. P. Jerrard of Caribou, Me., in 1905, who stated that the seed came from a customer. It has never been grown at this Station, but according to Tracy, it is decidedly the earliest of the *coccineus* group. It mostly resembles Barteldes Bush Lima, differing principally in earlier season and smaller size. It may be just another strain of the old Indian Bean of the Southwest referred to in the account of Barteldes Bush Lima.

Barteldes Bush Lima. Refs. 7, 48, 91. Syns. *Aztec*, *Bush Multiflora*, *California Butter*, *California Cream Butter*, *Grand Valley White Egg*, *Havai Supai*, *Mexican Lima*. So far as we have been able to determine, this variety had its origin generations ago. Burbank related that it was supposed to have been found in a sealed vase in an ancient Aztec dwelling in New Mexico. The evidence secured from various references and catalogues indicates that the above synonymy is probably correct. Since the variety has never been grown at this Station, the material presented is the result of a review of literature pertaining to it, therefore the veracity of these statements can neither be absolutely confirmed nor denied. Some samples indicate slight differences in some of the names written as synonyms, but they are all believed to be strains of an old Mexican or Indian bean — undoubtedly the one now known as *Aztec*. Like several so-called lima beans of the bush type, this is mis-named, since it does not belong either to the small- or the large-seeded limas, but to *P. coccineus* — the flowering bean. It cannot be considered a true bush bean since it has a distinct running, spreading habit that forms a dense flat mass of runners over the ground around the central stem.

The variety was formally introduced about 1890 by F. Barteldes & Co., who obtained the seed from Colorado. At present the variety is no longer listed under the above name, but the names *Aztec* and *Grand Valley White Egg* are used by some seed houses located in the Southwest. *Barteldes Bush Lima* is of a perennial nature in the Southwest, its probable nativity. In a test carried out by Bailey at Ithaca in 1895, the only one in the East of which we have a record, some of the plants developed a thickened perennial root, while others, grown from the same seed packet, produced distinctly fibrous roots.

According to Tracy the variety is similar to *Aroostook Bush Lima*, differing chiefly in having a larger vine, seed, and pod, greater productiveness, and later season. Under suitable conditions it produces green shell pods much earlier than *White Dutch Runner* or the true bush lima. The snap beans are considered by

some to be superior to the tough kidney varieties, such as *Black Valentine* and *Davis Wax*.

Plant very large, thick stemmed, with long fruit branches, vining, vigorous, generally unproductive, altho this depends on environment. Foliage moderately abundant; leaflets large, dark green, smooth. Flowers numerous, large, white.

Snap pods varying in size, usually long, much curved, flat, dark green with rough surface. Green shell pods borne in clusters well above foliage, about $5\frac{1}{2}$ –6 inches long, containing 4–5 seeds well separated in pods.

Seeds very large, much thickened, very plump reniform, nearly circular, thru cross-section. Ends uniformly rounded. Hilum small, flat. Color glossy, white over the entire surface, the veining being either very light or absent.

Bijou. This variety was grown and introduced by Watkins and Simpson in 1922. A year later it was listed by Fottler, Fiske, and Rawson in the United States and was grown in our tests sometime later. So far it has not met with great popularity. It is rather late and, as grown here, not very productive. It grew somewhat taller than specified by the introducer, however, occasionally reaching 6 feet. The seeds are only about half the size of *Scarlet Runner*, with pods two-thirds as long, averaging about $4\frac{1}{2}$ inches.

Plant semi-dwarf, quite vigorous, and fairly productive. Stem slender, inclined to have a brownish tinge below the nodes. Foliage medium abundant, moderately dark dull green, smooth, and medium thick. Leaflets small, short, and very broad ($2\frac{1}{8} \times 2\frac{1}{4}$ inches). Flowers scarlet, quite numerous, large, borne on moderately long flower stalks.

Pods dark dull green, good quality, stringless, brittle and fine texture. Size moderately short, rather narrow, but plump ($4\frac{1}{2}$ –5 \times $\frac{1}{2}$ – $\frac{5}{8}$ \times $\frac{3}{8}$ – $\frac{7}{16}$ inches) containing 5 seeds. Shape oval, ovate to cordate in cross-section, moderately curved, slightly hump-backed, regular not crowded, filled to the tip and edge, moderately smooth, and moderately rounded at the end. Spur medium short, thick and straight to slightly curved. Suture, placental slightly indented and carpellary, broadly acute.

Seeds medium (1.7 \times .9 \times .65 cm.), containing 45–50 to the oz. Shape long broad reniform, somewhat flattened, ends uniformly but abruptly rounded. Hilum large, flattened. Color shining black mottled mostly on the ends and carpellary suture with a deep red (ox-blood red to carmine).

Black Runner. Refs. 47, 56, 93, 94. Syns. *Arabische schwarze*, *Black Seeded Runner*, *Black Stake*, *Haricot d'Espagne a grain noir*, *Phaseolus multiflorus niger*, *Stangenbohne*. This appears to be one of the oldest varieties of which we have a direct record. Martens wrote that it was described by Titus in 1654 who pictured it as one of the most beautiful and rarest beans. No record of its growth has been found in America with the exception of Irish's trials at the Missouri Botanical Garden. It is largely from his report that this meager description has been written.

Plants climbing, branches reddish in color; flowers deep scarlet red. Pods flamed brownish red. Seeds large, $\frac{3}{4}$ –1 \times $\frac{3}{8}$ – $\frac{1}{2}$ \times $\frac{1}{2}$ \times $\frac{3}{8}$ inches in Europe, slightly smaller in this country. Coal black in color.

Butterfly. Syns. *Papilio*. This is one of the bi-colored types. It was listed by Vaughan in 1908 and by Webber & Don in 1911, and was considered at that time to be equal to the standard old varieties in productiveness and quality. It had the additional feature, in which it was to far surpass the others, of size and two-toned

color of the flowers. These were very large with white wings and salmon rose standards. The variety was most like Scarlet Runner, differing chiefly in having less dense foliage, leaflets smaller and smoother surfaced, and the bi-colored flowers.

Plant large, climbing, quite vigorous; moderately thick stemmed. Foliage moderately abundant, dark glossy green, smooth and quite thick. Leaflets medium size, very broad ($2\frac{1}{2}$ – $2\frac{3}{4}$ x $2\frac{5}{8}$ – $2\frac{1}{4}$ inches). Flowers large, wings white, keel salmon and rose or orange borne on large flower stalks.

Snap pods moderately dark green in color, fair quality, very firm fleshed, stringy and moderate amount of fiber, green shell pods medium long, $4\frac{1}{2}$ inches, $\frac{5}{8}$ – $\frac{1}{8}$ inches wide and $\frac{3}{8}$ – $\frac{1}{2}$ inch thick. Broad oval in cross-section, slightly curved, slightly crease backed, moderately constricted, not crowded, smooth, filled to the tip and edge and abruptly tapered at the end. Spur medium long, stout and slightly recurved. Suture placental, slightly indented and carpellary, rounded.

Seeds medium to large (1.7 x 1.2 x .8 cm.) containing about 21 to the ounce. Shape broad oblong, sub-reniform, plump, ends rounded, one more abruptly than the other. Hilum large, flattened. Color (grayish olive to deep grayish olive) over 85 per cent of the surface, mottled especially on the ends and sutures with light salmon (ochraceous-orange), marked with a narrow dark reddish brown (russet) eye-ring.

Painted Lady. Refs. 28, 47, 56, 91, 98. Syns. Bicolor Runner, Bunt Bluhende Bohne, Haricot d'Espagne bicolor, Painted Runner, York & Lancaster. This is one of the bi-color varieties mentioned in the older literature. It apparently is of little importance in North America, since it was listed by comparatively few seedsmen. Tracy stated that it was listed at least since 1855, but Martens relates that the bi-color type was first described by Arrabida in his *Flora of Rio Janeiro* in 1827. The variety may best be described by comparing it to Scarlet Runner. It differs from that variety in having smaller pods, flowers that have the lower petals pinkish white with the remaining portions scarlet, and seeds that are dark brown to black and mottled with creamy white, especially on the carpellary suture, ends, and portions of the sides.

Scarlet Runner. Refs. 13, 28, 32, 47, 48, 52, 56, 91, 93, 94, 97, 98. Syns. Carter's Champion, Champion Scarlet, Conqueror, Fire Bean, Haricot d'Espagne rouge, Mammoth, Ne Plus Ultra Runner, Red Giant, Scarlet, Scarlet Emperor. This variety is one of the oldest now in existence. According to Miller's *Dictionary*, he was the first to bring it into repute as a vegetable about 1750, although it had been known many years previous. In America it has been grown at least since 1800 and was listed by Thorburn as early as 1822. The variety, or at least the type it represents, is comparatively well-known in this country and is used both for an esculent and for ornamental purposes. The variety does not, however, assume the importance in this country that it does in Europe, especially the British Isles. Its culinary usage is confined to both snap pods and green shells and is generally accepted to take the place of limas that do not develop successfully in the cooler climates. In this country the variety develops to perfection in California,

although favorable reports have been received from other sections. At Geneva our records show that the variety is good in both vigor and yield. There are many strains of this variety in cultivation, all of which are very similar in most respects, but differ slightly in length and width of pods and occasionally in number of days to maturity and size of dry seeds. Fundamentally, they are the same. Therefore, in this discussion, it should be borne in mind that the specific description to follow is more of a type description than one for a single variety. It should be suggested, therefore, that the synonymy of Scarlet Runner not be interpreted too literally, since some of the names represent strains that may be classified in the above category.

Plant large, growth 12–15 feet, climbing, rather open in habit; vigorous, moderately productive. Stem moderately thick, tinged with brownish purple. Branches medium in number, both basal and medial in position. Foliage abundant to almost dense, dark glossy green, smooth, moderately thin. Pubescence very light or absent. Leaflets medium in size, moderately short but quite broad at the base ($3\frac{3}{4}$ x $3\frac{3}{8}$ – $3\frac{5}{8}$ inches), underside of veins tinged with purple. Flowers scarlet, very large, about 20–40 on each long flower stalk.

Snap pods dark green in color; fair quality, moderately brittle, firm fleshed, somewhat stringy and rather coarse in texture. Size medium long to very long, broad, stout, $5\frac{1}{2}$ –8 x $\frac{1}{16}$ – $\frac{1}{8}$ x $\frac{3}{8}$ – $\frac{1}{2}$. Shape oval, broad ovate thru cross-section, slightly curved, straight-backed, quite regular, not crowded, moderately rough surface, filled to the tip and the edge and rounded at the end. Spur short, thick and decidedly curved or recurved. Suture, placental is flat to very slightly indented and carpellary, obtuse.

Seeds very large (2.3 x 1.2 x .9 cm.), 20–25 per oz. Shape oblong reniform to sub-reniform, moderately plump, long oval thru cross-section. Ends uniformly well rounded. Hilum large, white, and flattened, occasionally somewhat incurved. Color shining black to violet black mottled with deep red (ox-blood to carmine) mostly on the carpellary suture and ends and to some extent on the sides.

White Dutch Runner. Refs. 13, 28, 32, 47, 48, 52, 56, 91, 93, 97, 98. Syns. Chelsea, Childs Extra Early Lima, Dutch Runner, Haricot d'Espagne Blanc, Improved Prolific, Isbell's Perfect, Mammoth, Monarch, Oregon Pole Lima. This variety is another of the very old ones and apparently has been known nearly as long in this country as Scarlet Runner. Tracy states that it was listed by American seedsmen as early as 1825. The variety may be compared to Scarlet Runner which it resembles very closely, differing from that variety in having stems and leaf veins solid green and flowers and seeds pure white. Similar assertions may be made relative to minor strain differences as related in the discussion of Scarlet Runner. It is believed that the synonymy of this variety is parallel. Oregon Pale Lima is especially adapted to the Northwest and, although the name is apparently not listed by seed-houses elsewhere, it is here illustrated because of its importance in that region. As mentioned in Scarlet Runner, certain minor strain differences exist between the synonyms given, but inasmuch as the climate at this Station is not suited for the best development of this species, we have been unable to tell the exact differences with any degree of certainty.

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N B Names followed by *see*, such as Adams Stringless, refer to strains or stocks not available or to those which remained unplaced either as synonyms or as separate varieties. Names in Roman type, such as Abundance, are described in the text. Page numbers in bold face refer to pages opposite plate illustrating the variety. Certain variety names occurring only on the illustrations represent types photographed before the present writers became associated with the work. Because of the difficulty in obtaining seed for further trial or the uncertainty in the application of the names these are not treated in the text.

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VEGETABLES OF NEW YORK

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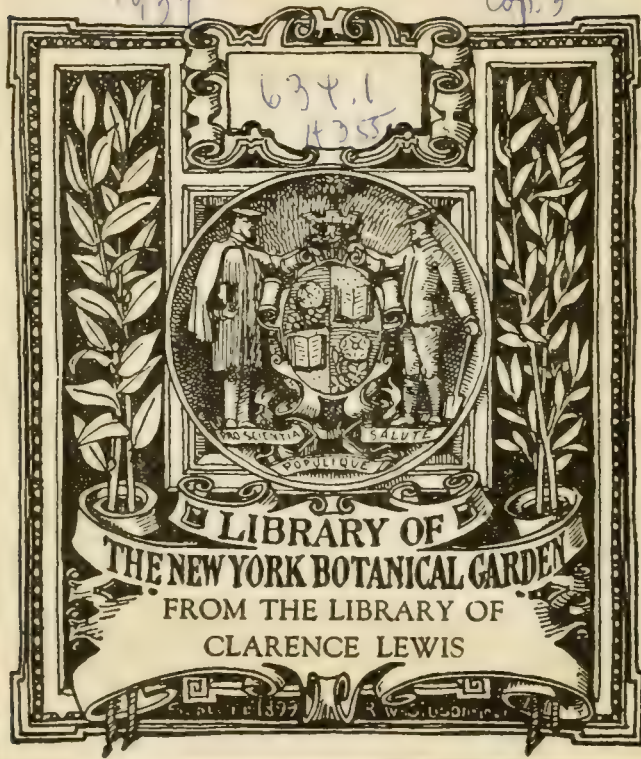
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STATE OF NEW YORK — EDUCATION DEPARTMENT

THE VEGETABLES OF NEW YORK

BY

WILLIAM T. TAPLEY

WALTER D. ENZIE

GLEN P. VAN ESELTINE

REPORT OF THE
NEW YORK STATE AGRICULTURAL EXPERIMENT STATION
FOR THE YEAR ENDING JUNE 30, 1934



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P R E F A C E

Under authority from the State, Laws of 1925, the New York State Agricultural Experiment Station is publishing a work entitled *The Vegetables of New York*. The publication is to be issued in three volumes of several parts each. Part I of Volume 1, The Peas of New York, was printed in 1928; Part II, The Beans of New York, was printed in 1931. The Sweet Corn of New York now appears as Part III of Volume I.

The Vegetables of New York is intended to be a more or less complete record of the vegetables grown in New York. In this work the separate chapters give the historical and botanical status of Maize; full horticultural descriptions of sweet and other types of corn used as a vegetable; and as complete a history of the evolution of these varieties as will show their past and present standing.

The chief value to seedsmen and to growers of sweet corn lies in the discussion of varieties. The considerations which have governed the selection of varieties for full description and separation into major or minor sorts are: The present value to commercial and home growers of vegetables, the potential merit of new varieties, and the previous importance of historical varieties to the trade. An effort has also been made to give the vegetable breeder as complete information as possible on the characters of seed, plant and fruit, to describe varieties which have in the past been leading sorts and which therefore are of value in showing the trend of evolution in sweet corn, and to indicate the relationship of varieties.

Chapter II on the Systematic Botany of Maize and that part of Chapter I on the early history of corn were written by Professor Van Eseltine, Systematic Botanist for this Station. The remainder of the work was written by Professors Tapley and Enzie. The authors wish to acknowledge many helpful suggestions from Professor C. B. Sayre, Chief of the Division of Vegetable Crops at this Station.

U. P. HEDRICK

Director, New York Agricultural Experiment Station

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THE VEGETABLES OF NEW YORK. I

LEGUMES, CUCURBITS, CORN, ALLIUMS

PART III: SWEET CORN

CHAPTER I
HISTORY OF CORN

In the early days of the earth, when the Spirit of Good brought the birds and animals from the sun land, one of the birds, the crow, carried in his ear a grain of maize. The Spirit of Good planted this on his Mother's (the earth's) breast, and it became the first grain, the "life" of the red man. So runs the Iroquois legend of the origin of corn.¹

There are many other legends among the various tribes of American Indians, and it is significant of the great age of maize culture that all tribes so far as known, in both North and South America, have no theories or historical explanations of their use of corn — only these myths and legends. Moreover, it is claimed by one investigator that "from purely botanical reasoning, based on a detailed comparison of maize with its wild relatives, Indian corn may confidently be proclaimed the most ancient of the cultivated cereals, if not of all cultivated plants."²

The beginnings of the story of corn are lost in perhaps the densest of the fogs of uncertainty and of time surrounding the origin of any of our cultivated plants. A number of hypotheses³ have been suggested as to the origin of corn as a domesticated plant, but each meets objections of fact that prevent unqualified acceptance by close students of the question.

One theory is that corn at one time existed as a wild form in practically its present state. But no form that we know at present seems able to exist in competition with wild vegetation. All forms known are dependent on man for continued existence.

Another theory is that corn may have arisen as a sport or mutation of some wild species, but geneticists find unanswerable objections in the characters of hybrids with the nearest forms.

A third theory is that it may have arisen from teosinte, its closest botanical ally, or from crossing a closely allied plant with teosinte; but the character of the fruit of teosinte offers objections to this hypothesis, as do the characters of all known mutations of corn.

A fourth theory is that corn is the culmination of a line of plants that originated at or before the time that teosinte became differentiated. One objection here seems to be the time element involved in consideration of the dependability of the plant upon man, and another is the close affinity to teosinte as shown by its inter-fertility with that species.

It should be noted here that apparently every acre

of land throughout Mexico, Central America, and Northern South America that furnishes the proper habitat for a wild maize, or a wild species allied to maize, has been or now is cultivated land. In fact, practically all teosinte is found either at the edge of corn fields or in deserted cornfields. It is possible that the wild ancestor of maize, if such a plant existed, has been exterminated by Indian civilization as thoroughly as the passenger pigeon and the great auk have been eradicated by white civilization in the comparatively recent past. The opinion of De Candolle that the natural area of corn was very small should be considered in this connection.

"If ever a plant could be said to be designed for the use of man, that plant is Indian corn. And in accordance with this seemingly providential plan, maize and man are inseparably associated in America as far back as human remains are found. Nowhere does maize grow without man's aid nor can it. . . . That the artificial development of maize had attained a high level in very early times is attested not only by the size of the prehistoric ears but also by their coloration. It is surely no accident that maize is the most decorative of crop plants, and clearly the element of art had entered into its breeding more than 2,000 years ago."⁴

The first tangible point in the history of corn is a fossil ear which was purchased from a collector of curios in Peru in 1914. This ear is said by the describer⁵ to be at least several thousand years old and is similar in individual characters to various Peruvian and Bolivian varieties.

The second earliest record seems to be the ears found on the island of San Lorenzo, near Pallao, Peru, by Darwin,⁶ who says, "I was much interested by finding on the terrace at the height of eighty-five feet, *embedded* amidst the shells and much sea-drifted rubbish, some bits of cotton thread, plaited rush, and the head of a stalk of Indian corn; I compared these relics with similar ones taken out of Huacas, or old Peruvian tombs and found them identical in appearance." In another place⁷ he states that various facts "render it almost certain that they were accumulated on a true beach, since upraised eighty-five feet, and upraised this much since *Indian man inhabited Peru*." This would seem to indicate that both corn and man had occupied this region for a number of centuries.

¹ Iroquois myths and legends. *N. Y. State Museum Bul.* 437; 63. 1908.

² Kempton, J. H. Maize, the plant-breeding Achievement of the American Indian. *Smithsonian Sci. Ser.*, 11: 324. 1931.

³ The reader interested in a thorough discussion of these theories is referred to Collins, G. N. The phylogeny of maize. *Bul. Torrey Bot. Club*, 57:199-210. 1930.

⁴ Kempton, J. H. *Loc. cit.*, 326-327.

⁵ Knowlton, F. H. *Jour. Wash. Acad. Sci.*, 9:134. 1919.

⁶ Darwin, C. R. *Journal Researches*, 370. *Appleton*. 1896.

⁷ Darwin, C. R. *Geological Observations*, 269. *Appleton*. 1897.

These two early records may have some bearing on the question of the place of origin of corn which had been thought for a long time to be Mexico because of the occurrence there of corn's nearest ally, teosinte. Within the past year, however, teosinte has been found wild as far south as Guatemala. Moreover, the recent theory of Professor Vavilov that the center of distribution of any cultivated species is the region showing the greatest number of distinct types points to northwestern South America. As regards maize, this theory was foreshadowed by Sturtevant's statement in 1894¹ that, "the superior development of varieties . . . is strong evidence in favor of a South American origin." It is, at least, certain that corn must have originated in the higher regions of tropical or subtropical America, regardless of which theory of origin is finally accepted.

Ears and cobs have been found in the pre-Columbian storage places of Pueblos, Cliff-dwellers, Aztecs, and Peruvians; and charred cobs and kernels have been discovered in ancient pits throughout eastern North America.

In the southwestern United States ethnologists recognize six culture periods, viz., Basket Maker I, II, and III, and Pueblo I, II, and III. They have established the date 1275 A. D. for the ending of the last period and buildings dated at 784 A. D. in Pueblo II and 660 A. D. in Pueblo I have been noted;² but beyond the probability that each period covered several centuries, no evidence has yet arisen that has enabled them to date the earlier periods with any degree of certainty. However, a single type of flint corn has been found in the period designated as Basket Maker II, and more numerous forms in each succeeding period.

"In Central America the beginnings of the Maya culture go back at least seven centuries before Christ. No actual plant remains survive in this wet country, but we have representations in art of a corn god whose head dress is a conventionalized ear of corn . . . These sculptures belong to the 4th and 5th centuries A. D."³

Columbus was apparently the first European to record corn when he wrote that he saw "a kind of grain called maiz" on the island of Cuba in 1492. However, it is possible that Columbus was not the first to see maize growing. The legends concerning the discovery of corn, as well as grapes, by the Norsemen in *Wineland the Good*, early in the eleventh century have been pretty thoroughly discredited. Fernald⁴ maintained on botanical evidence that if the legends were to be accepted, then the plants noted in the Icelandic sagas as "hveiti," and assumed by many writers to

be maize, were lyme-grass, *Elymus arenarius*, and that the "vinber" were not grapes, but more probably "wineberries," *Vaccinium Vitis-idaea*. Andrews, in a review⁵ of Fernald's paper, states that "Nansen with the able assistance of his colleagues, Torp, Moe, and others finds that the grapes and the self sown wheat (hveiti) . . . are an offshoot of common medieval legends of the 'Islands of the Blest' . . ." There are also legends⁶ of Norsemen, captured by the natives, who were said to have traveled over a considerable portion of eastern North America before finally escaping to rejoin their countrymen in Greenland or Iceland. If there is a real basis of truth in these tales, it is not impossible that these hardy souls were the first Europeans to have actual experience with maize.

Eleven years after the discovery of maize in Cuba, Diego Bartholomew "saw above six leagues of ground full of maize and cultivated" on the American mainland. "In 1520 the Spaniards in the battle with the Tepeacans were embarrassed by the tall maize that covered part of the plain."⁷ In this same year "Magellan found maize at Rio de Janiero," and the Spaniards found corn of numerous types in Peru. Narvaez discovered maize to be a bounteous crop in Florida and westward in 1528 and "during De Soto's invasion, 1540, maes was found everywhere along his route from Florida and Alabama to the upper part of the Mississippi, probably on the western bank of the Yazoo, in fields or stored in granaries." "When Cartier visited Hochelaga, now Montreal in 1535, that town was situated in the midst of extensive corn fields, 'the grain even as the millet of Brazil, as great and somewhat bigger than small peason.'"

Excerpts from the records of all the early adventurers in America tell us this same story of maize in comparative abundance from the Great Lakes of North America to the highlands of Peru and from Brazil back to what is now the state of Washington — not only was corn grown abundantly, but there were numerous varieties, yellow, red, blue, black, white, pink, and pied; smallkerneled and large; hard corns and soft corns; few-rowed and many-rowed. In fact, in so far as varieties of maize are concerned, one might well say "there is nothing new under the sun" for the Indians seem to have had practically every type that we now know and seem to have paid a great deal of attention to some types, particularly color forms, that are unfamiliar to most people today.

"In Europe, maize is said by Benzon, who wrote in 1572, to have been brought by Columbus on his return from America to Spain, along with parrots and

¹ Sturtevant, E. L. Notes on maize. *Bul. Torrey Bot. Club.*, 21:341. 1894.

² Cotton, H. S. *Science*, 77:240. 1933.

³ This quotation is from a letter of Dr. Herbert J. Spinden, Curator of Ethnology, Brooklyn Museum. The preceding paragraph is likewise largely an adaptation from the same letter. It is a pleasure to acknowledge our indebtedness to Dr. Spinden for the information given therein.

⁴ Fernald, M. L. Notes on the plants of *Wineland the Good*. *Rhodora*, 12:17. 1910.

⁵ Andrews, Leroy. *Rhodora*, 15:28. 1913.

⁶ See in this connection, Fiske, John, *Discovery of America*, 1:244 ff. 1893.

⁷ Sturtevant's Notes on Edible Plants, 610. 1919. The preceding quotation as well as those following which are without reference are from the same source.

other new Indian articles." It is said to have been cultivated in Andalusia and about Madrid before 1525. "In Germany, corn is mentioned by Bock, or Tragus as he is often called, who is one of the earliest writers on German plants and published in 1539." Apparently maize was known in France before 1536, but seems not to have been cultivated in Italy before the latter part of the sixteenth century. The Portuguese apparently carried maize on many of their numerous adventurings during the period 1500 to 1600 A. D., and introduced its culture fairly early in that century into Africa and parts of Asia. "Corn reached China in 1516," according to Malte-Brun. However, according to Weatherwax,¹ "several accounts in Chinese literature of the sixteenth century have been cited as evidence that maize was known in China in pre-Columbian times. . . . [but] there has been cited no authentic mention of maize in Chinese literature definitely known to antedate the appearance of the Portuguese in the Orient in 1516." In this connection a peculiar form of maize described by Collins² from China and dissimilar to any known American type should be noted.

"Today maize is extensively grown in Mexico, Argentina, Hungary, Roumania, Italy, Russia, Egypt, India, and South Africa; and, to a less extent, in Canada, Peru, Chile, Central America, Spain, Portugal, France, Germany, China, Japan, Australia, and the Philippines. But it is still principally an American crop, the United States producing each year three times as much as all other countries together."³

In reference to the great amount of corn produced in this country, it is of interest to note the increasing number of uses for the crop which American ingenuity has discovered. Aside from the use of the grain as a source of human food and of both the grain and vegetative parts as feed for animals, there are a hundred or more by-products now being used in American industries. A few of the more important are: Corn oil in soaps, liniments, dyes, paints, and oil cloth; corn dextrans for library pastes, size, and glazes; corn "gum" (a rubber substitute) in bath sponges, pencil erasers, can "rubbers," and hot water bottles; corn cellulose in press boards and insulating material; and finally, various chemical residues in maizolith for fountain pens, pipe bits, and similar objects.⁴

No history of maize, however compressed, can omit reference to the sumptuous volume of Mathieu Bonafous, an elephant folio of 181 pages with 19 colored plates published in Paris in 1836. This *Histoire Naturelle, Agricole, et Economique du Mais* was apparently the first monograph on Indian corn. Bonafous' theories on the origin of maize and his system of classification have been largely superseded with the acquisition of

more knowledge and only his names for three endosperm types remain current today. These include *Zea Mays rugosa* as the designation for sweet corn.

Friedrich Alefeld proposed a very artificial classification in his *Landwirtschaftliche Flora* in 1866 which was considerably modified by Friedrich Körnicke in his *Systematische Übersicht der Cerealen* in 1873. Here the latter author grouped the sweet corn varieties together under the name *Zea Mays saccharata*, but, unfortunately, made color of kernel the chief distinguishing feature of his classification. Today, this system seems of little use in view of the preponderance of yellow and white types and the comparative unpopularity of all other colors in the chief sweet corn producing areas.

A number of quotations have already been made from the work of E. L. Sturtevant, first director of this Station. His work has profoundly influenced the study of maize in this country, and all students of corn are indebted to his keen insight and his laborious research.

The works of Weatherwax, Collins, and Kempton, cited in preceding footnotes, should be consulted by the reader who wishes to delve more exhaustively into the results of recent studies of maize.

Sweet corn, the particular type of maize of interest for this account, seems not to have attracted especial interest among the Indians. No evidence thus far produced shows any particular ceremony connected with it similar to the religious rites attached to certain color types among some of the tribes. Yet it was undoubtedly distributed widely, as Hendry⁵ describes an ear of sweet corn from near Huamachucho, Peru, collected by M. Uhle and dating from 1000 to 1534 A. D. The final paragraphs of his paper are of particular interest here. He says, "It seems reasonable to conclude as follows: First, that sweet maize has been derived through mutation from an older endosperm type or types, and that such mutation has occurred in at least one instance in the Peruvian Highlands prior to 1534 A. D.

"Second, since only varieties of the floury and flint types are known to have existed there . . . and since the specimen resembles the former in minor varietal characteristics, . . . it seems probable that in this instance the sweet mutant first appeared in a variety of the floury type.

"Third, a distinct group of sweet varieties . . . is to be found under cultivation among the Indians of the arid Southwest, and probably in Peru."

Of its appearance in the records of white men, perhaps the best statement is that of Sturtevant,⁶ which follows:

"The history of the appearance of sweet corn in gardens shows it to be quite modern. In the *New*

¹ Weatherwax, Paul. The Story of the Maize Plant, 18. 1923.

² Collins, G. N. A new type of Indian corn from China. U. S. Dept. Agr. Bur. Plant Ind. Bul. 161. 1909.

³ Weatherwax, Paul. Loc. cit., 17.

⁴ For further information on by-products of corn the reader is referred to Slosson, E. E. Creative Chemistry, Chap. 10. 1920; and also to Weatherwax, Paul. Loc. cit., Chap. 25.

⁵ Hendry, G. W. Archeological evidence concerning the origin of sweet maize. Jour. Amer. Soc. Agron., 22:508-514. 1930.

⁶ Sturtevant's Notes on Edible Plants, 619. 1919.

England Farmer, Aug. 3, 1822, it is said 'a writer in the Plymouth paper asserts that sweet corn was not known in New England until a gentleman of that place, who was in Gen. Sullivan's expedition against the Indians in 1779, brought a few ears to Plymouth, which he found among the Indians on the border of the Susquehannah.' A writer the following September adds that this sweet corn was brought by Lieut. Richard Bagnal from Gen. Sullivan's expedition against the Six Nations in 1779 and was called papoon corn. 'That was the first of the species ever seen here, and has since that time been more and more diffused; and, I believe within a few years only, has undergone some change since it was first introduced—then the core was a bright crimson, and after being boiled and the corn taken off, if the corn was laid in contact with any linen, it communicated an indelible stain.' This inconvenience has disappeared. This species, also, like what is distinguished by the appellation of southern, or flat corn, by repeated plantings here, assimilates it to our local corn—"

"Sweet corn is not referred to by Jefferson in his 'Notes on Virginia,' 1781; nor by McMahon, 1806; nor by Gardiner and Hepburn, 1818; nor by Thorburn, 1817; nor by Randolph, 1818; nor by Fessenden, 1828. The seed catalog of Thorburn, 1828, offers one variety, the Sugar, or Sweet. In 1801 Bordley mentions the 'sweet corn, having a white, shrivelled grain when ripe' as yielding richer juice in the stalks than common corn. In 1832 'sweet or sugar' corn was mentioned among garden vegetables by Bridgeman."

A study of the literature covering the food crops of the American Indian indicates the limited number of forms which could have reached the hands of our early farmers. If the white-kerneled, red-cobbed form carried from the fields of the Susquehannah to Plymouth in 1779 was the first sweet corn known to the settlers, then all named varieties have originated within the last 150 years.

The writings of the early explorers do not give specific mention to sweet corns. In their study *Corn Among the Indians of the Upper Missouri*, Will and Hyde listed 104 named varieties of corn. These represented the cultivated sorts known to 14 or more tribes of that region. Four of these were sweet corn and included a 10-rowed variety grown by the Mandans, the seed of which was colored red-brown when hard and dry; a 10- to 16-rowed yellow sugar corn cultivated by the Pawnees; and a 14-rowed cream colored or very light yellow sweet corn grown by the Ponkas. The only white sort mentioned was the Iroquois Sweet Puckered which was included in a number of varieties coming from the Onondaga Reservation in New York State.

Scattered Corn, an elderly Mandan matron, whose father was the last Mandan corn priest and who herself is an excellent gardener, says that the varieties raised by her family were soft white, soft yellow, and wrinkled corn. The wrinkled type was a sweet corn of a brownish red color when ripe and hard and of a very good

flavor when green. This may have been the original of the variety Nuetta now grown in the northern plains section.

Two varieties of sweet corn are given by Parker in the list of forms grown by the Iroquois, Sweet or puckered and Black Sweet or black puckers. The first named might well have been the variety carried to Massachusetts by Lieut. Bagnal while the latter probably was an early form of our present day Black Mexican. What part these varieties played and when and how they found their way into the hands of the early settlers of New York may never be known. The last 50 years of the past century brought forth the gradual development of varietal nomenclature, as the total number of named varieties known during the fore part of the century possibly did not exceed 10.

In 1848 Salisbury,¹ who was awarded a premium of \$300 by the New York State Agricultural Society for an essay on maize or Indian corn, says, "There are several sub-varieties as the Small Early Sweet, the Rhode Island Sweet, the Hematite Sweet, and a new variety made by crossing the Sweet with the Early Canada."

The Hematite Sweet, having white kernels and a red cob, is described as smaller than Rhode Island Sweet but larger than Early Sweet. The ears were 8-rowed and well filled. The other two varieties had white kernels and white cobs, the ears of Small Early Sweet being 8- to 10-rowed and from 3 to 6 inches long and those of Rhode Island Sweet 8-rowed and 5 to 8 inches long. The fourth variety mentioned, the yellow cross, is one of the first recorded "hybrid" sweet corns. Both of the parents were 8-rowed, the flinty Canada Yellow giving the yellow color and the Early Sweet the sweet character. The date when this cross was made is not given, but since its existence was recorded in 1848 it must have originated sometime before that date. Until 1902, when Golden Bantam was introduced, yellow sweet corn was largely considered as unfit for use. Early Adams, a variety destitute of the corneous portion of the seed, was also mentioned. The kernels were described as having a shrivelled and dull appearance. This differs from the kernel characteristics of the Adams Early grown today.

From the *Magazine of Horticulture* of December 1850, the rise of another new variety can be followed. The account is rendered by the Rev. A. R. Pope of Somerville, Massachusetts, who carefully related the steps, beginning in 1845 and ending in 1850, incident to the introduction of the new variety which he named Old Colony, a name for that part of New England near Kingston, Massachusetts. "As soon as the pistils or silk [of Southern White] seemed in a mature state the opening stamens of sweet corn stalks were carefully brought, and the pollen from them gently shaken upon the pistils. . . . At the time of harvesting, more than one-half of the kernels bore all the ordinary outward appearances of sweet corn and had the sweetness peculiar to that variety, but taking the shape and size natural to the cob on which they were grown." Speci-

¹ Salisbury, J. H. Maize, or Indian corn. *Trans. N. Y. State Agr. Soc.*, 678-845. 1848.

men ears, which received favorable notice by the Horticultural Society's committee at the annual exhibition, had from 14 to 18 rows. The ears were formed on the stalks at 4 to 5 feet from the ground, "a circumstance of some importance to those who, for neighborly regard, unhappily keep fowls which they happily do not own."

The same magazine in 1851 copied a note written by Professor Mapes for "The Working Farmer," which related the superior qualities of Stowell's Sweet Corn. "This corn also is a hybrid between the Menomony soft corn and the Northern Sugar corn, and was first grown by Mr. Nathan Stowell of Burlington, New Jersey." The unusual quality of keeping long in the fresh green state is particularly noted. Seven years later the variety appeared in a list as Stowell's Evergreen. Since then this many-rowed sort has maintained its good qualities and today is an important variety for both canner and trucker.

In 1851, Buist mentioned two varieties. In 1853, Bement says of the Early Sweet Corn, the variety introduced by Capt. Bagnoll of Plymouth, that, "one kind has a white cob, the other a red cob, the ears are short and usually contain 8 rows." From Sturtevant, "In 1854, Schenck mentioned the Extra Early, the Eight-rowed Sweet, and Stowell's Sugar, which had been brought into notice within a few months. In 1858, Kippart listed New England Sweet or Sugar, Mammoth Sugar, Stowell's Evergreen, and says further that Yellow, Blue, and Red Sugars are all mere sports from the New England and are not desirable."

The varieties in common use during the early sixties were recorded by Burr in 1863. He mentioned Golden Sweet or Golden Sugar with dry kernels yellow, and Black Sweet or Slate Sweet with dry kernels black. Red Cob Sweet, having a red cob but white kernel, was described as having both an 8-rowed and a 12- to 14-rowed form. Of the white varieties, the Early Sugar or small 8-rowed type had given way to Darling's Early, which however was of independent origin. A 12-rowed Sweet appeared for the first time; and Burr's Improved, which was described as "an improved variety of the Twelve-Rowed Sweet," was also listed. This is the first mention of a variety which evidently was a straight selection from an established sort. Burr listed further Stowell's Evergreen, Old Colony, and Adams Early White, a dent form which has continued in use and which, although not a true sweet, has proved acceptable in quality to those to whom the peculiar, sugary character of the latter may be objectionable.

To recapitulate, the 8- to 10-rowed types with the kernels white, black, white with red cob, and brownish red with red cob, together with the 10- to 16-rowed sort with the kernels yellow and cream or very light yellow, have come from the Indians. Twelve-Rowed Sweet, Mammoth Sugar, Darling's Early, Early Adams, Old Colony, Stowell's Evergreen, and Golden Sweet were named varieties added by agriculturists in the period up to the Civil War. From this time on the acquisition of new varieties became greatly accelerated and the rise and fall of individual lines more difficult to follow.

Sturtevant, in 1884, listed 24 additional varieties as follows: Amber Cream, Asylum, Black Sugar, Clark's Old Colony, Crosby's Early, Dolly Dutton, Egyptian, Genesee, Hickox, Landreth, Marblehead, Marblehead Mammoth, Minnesota, Moore's Early, Narragansett, Ne Plus Ultra, Orange, Potter's Excelsior, Pratt's Early, Red River, Squantum, Tom Thumb, Triumph, and Wyoming. These were described with brief historical notes. From other lists of this period 20 names of lesser known sorts have been found. In these lists several new types appeared. Notable among these was the introduction of the red-cobbed, red-kerneled type represented by Narragansett, Red River, and Marblehead. This red type was crossed with Moore's Early to produce Orange. Crosby appeared from an unknown source and represented a markedly different type of ear. A selection made from the cross of Crosby and Burr's Improved resulted in Moore's Early which was very popular for many years. Other types appearing in this period are represented by Triumph, a long slender 8- to 10-rowed ear; Hickox, a large-eared variety that served the canning trade until very recently; and Ne Plus Ultra, the forerunner of Country Gentleman, unique because of the irregular distribution of kernels.

The next two decades saw the introduction of many more varieties, including Cory, which was possibly a selection from Marblehead; Henderson, similar to Hickox; Pee and Kay; and Stabler's Early and Shakers' Early. The name Country Gentleman was given to a further improved strain of the original Ne Plus Ultra or Shoe Peg. This variety, late and of high quality, would seem to be permanently established as an all-time favorite. Aristocrat, Champion, Howling Mob, Kendel's Giant, Peep O'Day, and several varieties of the Evergreen group were important in certain localities. Gold Coin from Livingston represented a new yellow type with 16 to 24 rows. Golden Bantam, probably a selection from the Golden Nugget of Gregory, was destined to become the most popular variety. All the superior factors of name, earliness, color, flavor were involved in increasing its popularity.

Ten years after the introduction of Golden Bantam the prejudice against yellow or horse corn, as this type was called, began to lessen and from then on the rise of the yellow and the decline of the white varieties is easily traced. Since 1910 there have been few white varieties that have been accepted and widely grown. This has been due not to any defects of the white varieties but rather to the partiality with which the public has viewed yellow sorts. In proportion to consumer demand the growers have gradually increased their plantings of the yellow varieties and decreased those of the whites.

White varieties which have had a period of considerable popularity are Country Gentleman, Howling Mob, Long Island Beauty, Mayflower, Mimms' Hybrid, Premier, Pocohontas, Stowell's Evergreen, and Whipple's Early White. During the last 15 years a number of varieties have been introduced that have met with a considerable sectional popularity but are too new to have stood the test of time. Among these are Alpha,

Cupid, Early Malcolm, Early Market, Silver Bantam, Surprise, and White Sunrise.

Pickaninny, a dwarf 8-rowed black, which originated at the Central Experimental Farm, Ottawa, Canada, should be mentioned because it is the first departure from the old and well-known Black Mexican. Will has stated that black sweet corn is very readily produced when either natural or intentional crosses occur between black and very dark blue flint or flour corn varieties and any of the sweet corn varieties.

The total number of yellow varieties which have been introduced is much smaller than the list of whites. Outstanding in the list are Banting, Bantam Evergreen, Barden's Wonder Bantam, Buttercup, Charlevoix, Gold Coin, Golden Bantam, Golden Early Market, Golden Gem, Golden Giant, Golden Nugget, Golden Rod, Golden Sweet, Spanish Gold, Sunshine, Seymour's Sweet Orange, and Whipple's Yellow. With the exception of Golden Sweet and the original Golden Nugget, all of these are grown today and are by far the most popular group of sweet corn varieties.

Variety names have served to designate types and forms throughout the period that sweet corn has been grown. Within recent years plant breeders have brought into existence new methods of producing sweet corn seed which involve the use of top crosses, inbreds, and hybrid inbreds. The seed produced has proved superior in yield and uniformity and has shown great possibilities in respect to disease resistance. The future alone will determine to how great an extent seed produced by these methods will replace the named varieties we have known for so long.

The organizations which originated the first-year

crosses have under their control the various inbred stocks necessary to perpetuate the hybrid. The inbreds must be maintained and the cross made each year. There is, therefore, considerably greater cost in producing seed of these stocks in comparison to the regular commercial varieties. The grower will have to determine after a trial whether or not the higher cost of seed will be compensated by higher yields and a higher quality product. It has been determined that the reaction of hybrid corn to a particular set of environmental conditions is very specific; thus, it may be necessary to test out many hybrids before the strain best suited is secured.

There are several of these new "combination varieties" ready for the grower. Bantam Evergreen Hybrid, Country Gentleman Hybrid, Crosgreen, Green Cross, Golden Cross, Golden Cross Bantam, Kingscrot, Narrow Grain Hybrid, Redgreen, Tendergold, Top Cross Bantam, and Stowell's Evergreen Hybrid are some of the first names that have been chosen for the representative types.

All of the varieties considered in this text could not have originated or been introduced without careful work on the part of many individuals. The incompleteness of this list is to be regretted, but information on this aspect of the history of sweet corn varieties is exceedingly meagre. Some of the outstanding men are H. C. Anthony, C. A. Barden, Fearing Burr, Jr., Luther Burbank, C. S. Clark, Everett B. Clark, William Cory, Josiah Crosby, Noyes Darling, Dr. Frederick S. De Lue, J. J. H. Gregory, D. F. Jones, A. C. Kendel, Capt. J. B. Moore, Arthur L. Richie, T. F. Ritchie, Thomas Potter, H. J. Seymour, G. M. Smith, Henry Stabler, Nathan Stowell, Silas Whipple, and A. F. Yeager.

CHAPTER II

SYSTEMATIC BOTANY OF MAIZE, AND ITS ALLIES

Of all the plants grown for food throughout the world, it is probable that the most valuable and most widely cultivated are the six grasses — maize or Indian corn, wheat, oats, barley, rye, and rice — the value of the crops being approximately in the order shown. The sweet corn, treated in this part of *The Vegetables of New York*, is a group of sweet-kerneled varieties of that complex and variable species, maize.

Maize, as will be shown in the following pages, is undoubtedly the most highly specialized species in the plant family *Gramineae*. It is placed by systematic botanists in the subfamily *Panicatae*, tribe *Tripsaceae*. Its closest allies are naturally some of the other members of that tribe, but it also shows a very close relationship with many of the species of the closely allied tribe *Andropogoneae*. In fact, Hitchcock¹ says, "This tribe, [referring to *Tripsaceae*] is scarcely more than a division of the next tribe, *Andropogoneae*." This question is discussed more fully under the descriptions of the various genera. The relationship of the more important of these plants is shown in the following key.

KEY TO GENERA OF IMPORTANT ALLIES OF MAIZE

Spikelets bisexual wholly or in part, in pairs (occasionally in 3's) generally one sessile and with both stamens and pistil (perfect or bisexual) and the other pedicelled and perfect or not. (*Andropogoneae* in part.)

Pedicellate spikelet perfect as is the sessile one, both awnless.

1. *Saccharum*

Pedicellate spikelet staminate but without pistil, sessile spikelet perfect:

Spikelets awned, pedicel not thickened, the racemes mostly forming a compound panicle.....2. *Sorghum*

Spikelets awnless, pedicels thickened and appressed to the thickened rachis joint.....3. *Manisuris*

Spikelets unisexual, the staminate generally in pairs, one sessile and the other pedicelled, the pistillate spikelets separate from the staminate in the same or in a distinct spike (*Tripsaceae* in part); Staminate and pistillate spikelets on separate portions of the same spike, the pistillate portion of the long many-flowered spike breaking up into several one-seeded joints.

4. *Tripsacum*

Staminate spikelets in separate spikes forming terminal tassels, the pistillate forming spikes in the axils of the leaves:

Pistillate spikes distinct, imbedded in the hardened floral axis.

5. *Euchlaena*

Pistillate spikes aggregated in an ear surrounded by numerous husks, the floral axes grown together forming a cob.

6. *Zea*

1. *SACCHARUM* L. *Sp. Pl.* 54. 1753.

Perennial grasses with spikelets in pairs, one of each pair pedicelled and the other sessile, both perfect flowered, awnless, arranged in panicle racemes, the axis disjuncting below the spikelets; glumes somewhat hardened, the sterile lemma similar but hyaline; fertile lemma hyaline if present.²

¹ Hitchcock, A. S. *A Text-book of Grasses*, 158. *Macmillan*. 1922.

² The generic descriptions given here are adapted from Hitchcock, A. S. *The Genera of Grasses of the United States*. *United States Dept. Agr. Bul.* 772. 1920.

³ Weatherwax, Paul. *Loc. cit.* 30.

Ten species are now recognized of which *S. officinarum* L., the sugar cane, is the most important. Grown chiefly for the production of sugar and molasses but to some extent for forage, it is noted here merely as being somewhat distantly related to maize.

2. *SORGHUM* Moench, *Meth.* 207. 1794.—*Holcus* L. *Sp. Pl.* 1047. 1753, in part.—*Blumenbachia* Koel. *Descr. Gram.* 28. 1802.

Perennial or annual grasses with spikelets (except the terminal) in pairs, one sessile, perfect and awned, the other pedicelled, awnless, and usually staminate, the terminal sessile spikelet with two pedicellate spikelets; the spikelets arranged in terminal panicles of one to five tardily disjuncting racemes.

There are about six species of which two are cultivated in the United States, chiefly in the South. *S. halepensis*, Johnson grass, is a forage grass. *S. vulgare* Pers., sorghum or sorgo, has many races or varieties grown under the names of broom corn, chicken corn, durra, feterita, kafir-corn, Kaoliang, milo, shallu, sorgo, and Sudan grass. The relationship of these plants to maize has been stated by Weatherwax³ as follows: "It is unfortunate . . . that monoecism (i. e. the bearing of pistillate and staminate flowers on different parts of the plant) was adopted as a unifying characteristic in forming the *Tripsaceae*. . . . A thorough morphological study of the *Andropogoneae* may ultimately show that maize and the sorghums represent one branch, and *Tripsacum*, *Euchlaena*, and *Rottboellia* [*Manisuris*] another, of the descendants of some common stock. The oriental *Tripsaceae* constitute almost a separate tribe."

3. *MANISURIS* L. *Mant.* 2:164. 1771.

Perennial grasses with awnless spikelets in pairs, one sessile and perfect, the other pedicelled and staminate, the pedicel thickened and appressed to the rachis; the spikes thus becoming narrow and cylindrical or nearly so; more or less leathery glumes, lemmas and palea thin, enclosed within a pedicelled spikelet, often rudimentary.

Of the numerous species of this genus none have attained sufficient economic importance to acquire a common English name. It is here noted solely because of its relationships and the mention made to it heretofore.

4. *TRIPSACUM* L. *Syst. Nat. ed. 10.* 2:1261. 1759.—Gama grass and its allies.—*Dactylodes* Zanoni-Monti ex Kuntze, *Rev. Gen. Pl.* 2:772. 1891.

Perennial grasses with unisexual spikelets; the staminate spikelets 2-flowered, in pairs, one sessile and the other pedicelled or sessile, similar to those of *Zea*, glumes firmer; the pistillate spikelets single and on opposite sides of a jointed thickened rachis, the lower portion of the same spike, and consisting of a perfect floret and a sterile lemma; glumes more or less leathery; lemmas and palea thin and hyaline.

There are about seven species of this genus, all American. Gama grass itself, *T. dactyloides*, L., has the widest range of the species found in the United States, occurring from Connecticut to Florida and Texas. Concerning its relationship with maize, Weatherwax¹ says, "The clearest and most reasonable deduction from the facts at hand is that *Zea*, *Euchlaena*, and *Tripsacum* descended directly and independently, in so far as hybridization is concerned, from a common ancestor now extinct." Maize has produced hybrids with *Tripsacum* when the pollen of the latter was used on silks of Maize. The reciprocal cross has not been successful. Mangelsdorf and Reeves² of the Texas Experiment Station have written an interesting account of their difficulties in procuring a few fertile seeds of this cross.

5. EUCHLAENA Schrad. *Ind. Sem. Hort. Goett.* 1832.—Teosinte.

Annual or perennial grasses with unisexual spikelets; the staminate spikelets similar to those of *Zea*: the pistillate somewhat similar to those of *Tripsacum*, but in separate spikes enclosed in husks, single, sunken in cavities on opposite sides of a jointed rachis, the hardened first glume covering the cavity; second glume membranaceous, lemmas hyaline; 2 to several pistillate spikes enclosed in a single leaf sheath.

There are two species of teosinte, the perennial, *E. perennis* Hitchc., and the annual, *E. mexicana* Schrad. This latter has two forms, the Floridan and the Mexican. Numerous crosses of *E. mexicana* and maize have been made and are fertile. Very few crosses have been made between maize and perennial teosinte. These are nearly all sterile. It has been suggested that annual teosinte may have arisen from a cross between perennial teosinte and maize, but proof is not forthcoming as yet.

6. ZEA L. *Sp. Pl.* 971. 1753.—Maize.—*Mais* Adans. *Fam.* 2:39. 1763. *Mays*. Gaertn. *Fruct. et Sem.* 1:6. 1788. *Mayzea* Raf. *Med. Fl.* 2:241. 1830. *Thalysia* Kuntze, *Rev. Gen.* 2:794. 1891.

Annual grass with unisexual spikelets, the staminate ones, 2-flowered, in pairs, one of each pair nearly sessile, the other pedicelled; glumes membranaceous; lemma and palea hyaline; pistillate spikelets sessile, in pairs, consisting of one fertile and one sterile floret, or occasionally of two fertile florets; glumes broad and rounded or emarginate at apex; style very long and slender.

Only one species, *Zea Mays* L., is known. It is discussed in detail in the following paragraphs. Unfortunately, many of the earlier investigators thought that every variation in the plants should have a scientific name, and consequently, a very abundant synonymy grew up. These names, placed in groups as nearly as can be determined on the basis of the often meagre descriptions, are given at the end of this chapter.

The corn plant in general structure is like other grasses with some interesting differences in a few details. The roots like those of other grasses are fibrous, never very large in diameter but often up to 5 or 6 feet in length. The first rootlet from the germinating seed is soon supplemented by two or three secondary roots

from the first node of the stem and these, too, soon lose their importance as longer and larger roots arise from successively higher nodes. As the plant begins to develop its greatest growth, brace, prop, or buttress roots usually begin to appear from the first few nodes above the ground level. These are thicker and stronger than the roots produced below ground level but otherwise have the same structure. They vary in different strains of corn.

The stem consists of a series of sections divided by swollen portions or nodes. The intervening portions, internodes, between each pair of nodes bear a leaf at the upper end and a bud or at least bud tissues, at the lower end. This bud may or may not develop into a branch. The internodes are filled with pith as in the *Andropogoneae*, but unlike those of most other grasses which are generally hollow. The growth of the internodes is similar, however, there being some capacity for increase in thickness in very young internodes and always capacity for increasing in length from the growing region at the base of each internode. The growth in length ordinarily slows up and gradually ceases as the plant matures but may continue if the plant is blown over by the wind or thrown on the ground by other accidents.

The leaf of maize like that of most other grasses shows three distinct portions. The first portion is a cylindrical sheath split down one side and with edges more or less overlapping throughout its length. This split often does not open until above the second node. It has been suggested that the sheath is homologous to the swollen base of the leaf stalks of the maple, for instance. In any case it serves to strengthen the stem and to protect the growing region of the next higher internode. The second portion is a long, flat, strap-shaped blade with a strong midrib and numerous smaller veins parallel to it. The blade tapers to a point at the tip and is more or less heart-shaped at the base where it meets the sheath, having generally a distinct lobe or auricle at each side. The third portion is a thin membranaceous collar, the ligule, which arises at the upper side of the juncture of the sheath and blade. It fits closely about the next internode thus protecting the latter from water, dust, and spores. The leaves are arranged in two ranks.

The buds on the lower internodes may develop large branches, suckers, or tillers, similar to the main stem, while one or more of those of the middle internodes produce short ear-bearing branches. The buds of the upper nodes may grow into small branches often not attaining the length of the enveloping sheath or may remain entirely dormant.

The terminal section of the main stem (and sometimes those of the suckers or tillers) develops into a staminate inflorescence or tassel, while the terminal section of some of the short middle branches develops into pistillate inflorescences or ears.

The tassel differs radically from the main stem below

¹ Weatherwax, Paul. *Loc. cit.* 30.

² Mangelsdorf, P. C., and Reeves, R. G. Hybridization of Maize, *Tripsacum*, and *Euchlaena*. *Jour. Heredity*, 22:329 ff. 1931.

it in that its branches are arranged spirally instead of in two ranks. Occasionally the tassel is not branched, but more often it shows secondary branching. The size and amount of branching of the tassel are more or less dependent on the vigor of the plant. The central spike of the tassel is remarkable in that the paired spikelets are arranged in several rows, whereas the lateral branches have the pairs of spikelets in two rows.

The ear resembles the central portion of the spike in that the paired spikelets are borne in several longitudinal rows. This peculiar arrangement of central spike and ear seems not to be homologous with the structure among other grasses and presents one of the baffling obstacles in the discovery of the origin of maize. The husks of the ear are merely leaf sheaths, often with somewhat reduced blades and ligules borne on very short internodes below the pistillate spike.

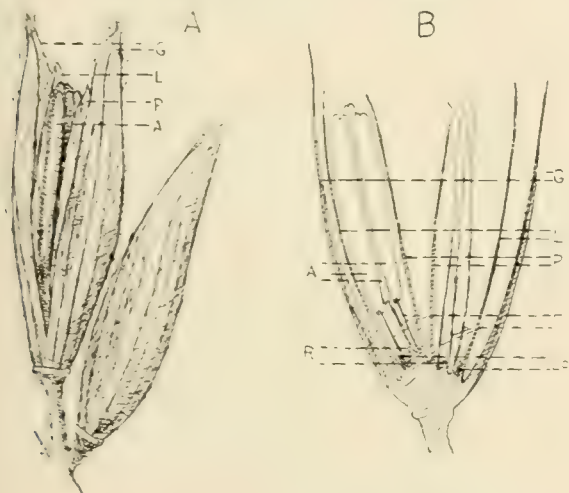


Fig. 1.—A, Pair of spikelets from a tassel of Independence ($\times 5$ diam.). This shows in the partially opened upper spikelet. The glumes, G; the lemma of the upper floret, L; the tip of the palea, P; and parts of the three anthers, A.

B, A semi-diagrammatic section through the same floret, showing the glumes, G; the lemma of each floret, L; the palea of each, P; the filaments of both sets of stamens, F; the anthers of one floret, A; the rudiments of the aborted pistils, P; and the position of one lodicule in each floret, Lo. The filaments of the second floret are drawn as they appear after the anthers have been extruded, cast their pollen, and fallen off. It should be noted, however, that the upper floret generally develops first.

In corn, as in other grasses (and in asters and chrysanthemums with their allies), the unit of the inflorescence is not the single flower but a group of flowers. In grasses this unit is the spikelet which generally consists of a more or less short axis at or near the base and on opposite sides of which are two glumes, bract-like or scale-like structures, one slightly higher than the other; and above these glumes one or more florets each having an outer scale, the lemma, and an inner scale, the palea, the latter inclosing the pistil and stamens and two or three fleshy scales, the lodicules. All variations from this typical spikelet are due to enhanced development or abortion of some of the parts. In maize and many of its allies the spikelets occur in pairs and each contains two florets, or, at least, one complete floret and the rudiment of a second. The staminate

spikelet of maize (as shown in fig. 1) has one spikelet of each pair pedicelled and the other sessile or nearly so. The membranaceous but firm glumes are nearly of equal length. The upper floret develops earlier than the lower. The lemma and palea are hyaline and nearly as long as the glumes. The two lodicules are at the back of the floret, and help spread open the glumes at time of flowering. There is a rudimentary pistil. The pistillate spikelet (fig. 2) is ordinarily greatly modified, the glumes being thick and fleshy and not completely enclosing the other parts. The lower floret is generally very rudimentary and the lemma and palea of the upper floret are shorter than the glumes. The lodicules of the upper floret are generally not as well developed as those of the lower.

There are numerous anomalies in maize inflorescences; perfect flowers occasionally being found,

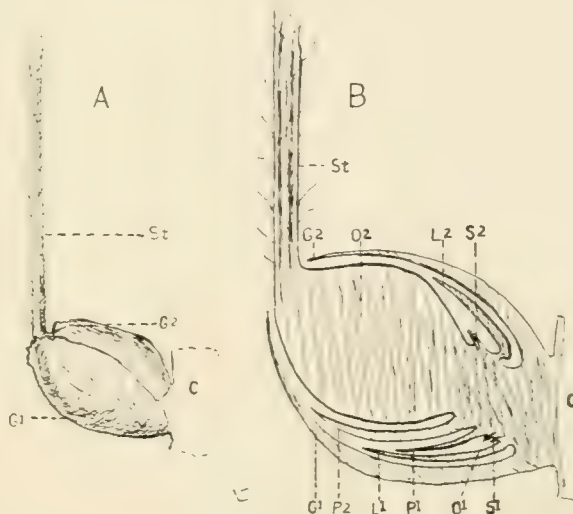


Fig. 2.—A, A single pistillate spikelet from young cob of Adams Extra Early ($\times 7\frac{1}{2}$ diam.), showing the lower portion of the style (silk), St; the first and second glumes, G¹ and G²; and a small portion of the floral axis or cob, C.

B, A semi-diagrammatic section of the same spikelet ($\times 15$ diam.), showing the basal portion of the style, St; the glumes, G¹ and G²; the lemma and palea of the aborted floret, L¹ and P¹; the aborted ovary (pistil) and stamen of this floret, O¹ and S¹; the lemma and palea of the developed upper floret, L² and P²; the fully developed ovary and aborted stamen of the upper floret, O² and S²; and the position of the cob, C.

pistillate flowers in the tassel and staminate flowers on the ear being more common. Spikelets of more than two flowers are sometimes found; and in varieties such as Country Gentleman both florets of each spikelet are fully developed.

The styles (silks) of the pistillate flowers are usually receptive to pollen for two weeks or more after they emerge from the husks. Although the lower flowers start growth about a week before the upper ones, the actual time of emergence of silk varies little more than 48 hours at most because of the distance that the lower silks must grow. The shedding of pollen from a tassel lasts from two or three days to as many weeks due to the fact that the upper branches mature before the lower ones, the tips before the base, and the lower florets of each spikelet before the upper ones.

While technically each grain is a true fruit—a

caryopsis, like that of other grasses, in which the fruit coats are united with the seed coat — nevertheless the whole ear is ordinarily considered as a single compound fruit.

It is almost entirely on the basis of the grains that the modern horticultural classification is built, though types are recognized on the basis of other characters. The characteristics of the various types are so easily subject to separations and recombinations by the plant breeder that the attempt to classify corn varieties into definite botanical subspecies is thought by most recent students to be futile. Some of the older botanists, unaware of the havoc that geneticists of the near future would wreak upon their pet schemes of classification, did, however, describe various so-called species and varieties until the number of names became very unwieldy and many of them quite meaningless.

M. Bonafous, in 1836, in his *Histoire naturelle, agricole, et économique du Mais*, seems to have been the first to attempt a classification of maize varieties, though there had been many treatments of various forms before that. However, his monograph remains a notable landmark in the literature of maize.

In 1866, Frederick Alefeld, in his *Landwirtschaftliche Flora*, attempted a more ambitious classification in which he described 50 varieties under six variety-groups. These are rather artificial as the first contained extraordinary types; the second, dwarf types; the third, branched types; the fourth, those with conical ears; the fifth, ordinary European field types; and the sixth, North American varieties of numerous kinds.

In 1873, Friedrich Körnicke, in his *Systematische Übersicht der Cerealen, etc.*, classified 64 varieties under 5 variety-groups. These were somewhat more natural than those of Alefeld. The first included extraordinary types; the second, concerning which mention has been made in the preceding chapter, included the sweet corn varieties; the third included dent corn types; the fourth, pop corns and other small-kerneled types; and the fifth all other types. Körnicke revised this system slightly in 1885 in the *Handbuch des Getreidebaues*.

From 1881 to 1899, E. L. Sturtevant, who was director of this Station during part of that time, published a number of articles dealing with the classification of maize and named, as "agricultural species," the pod corns, pop corns, sweet corns, flint corns, dent corns, starchy-sweet corns, and soft corns.

These names have some use as designating groups of horticultural varieties adapted for various purposes, as some of the other names that have been proposed have a certain degree of utility in designating types of value to the floriculturist or the geneticist. However,

these names do not signify subspecies or botanical varieties, though some of them might be designated properly as "formae."

The reason for not admitting as botanical entities such varieties as those proposed by Alefeld, Körnicke, and Sturtevant is that usually the varieties classified in one group can, with equal justice, be disposed in one or more of the other groups. This is illustrated admirably by Weatherwax¹ who, in discussing endosperm varieties, says, "Sweet corn is apparently the same as other varieties except that it has lost its ability to produce fully developed starch grains. Hybridization of sweet varieties with soft starchy varieties produces grains indicating that sweet corn may be differentiated into soft, flinty, and dent varieties that cannot synthesize starch efficiently." Pop corns are likewise generally small kerneled flint types; and pod corns, dwarf corns, and variegated leaf types, as well as ramose types and so on, may occur in any of the other forms.

However, since many of these terms have found their way into common usage and into the general literature of maize, an attempt is here made to list, as far as possible, the Latin names that have been applied to the various groups. Those names, the applications of which are very doubtful, are grouped at the end.

The synonymy² of maize follows:

ZEa MAYS L. SP. PL. 971. 1753.—MAIZE.

1. Synonyms of general application to the species as a whole:

Zea americana Mill. *Gard. Dict. ed. 8.* No. 1. 1768; *Zea alba* Mill. *l. c.* No. 2; *Zea vulgaris* Mill. *l. c.* No. 3; *Mays Zea* Gaertn. *Fruct. et Sem.* 1:6. 1788; *Zea Maiz* Vell. *Fl. Flum.* 10:t.3. 1790; *Zea segetalis* Salisb. *Prod.* 28. 1796; *Mays vulgaris* Ser. *Mel. Bot.* 2:182. 1819; *Zea altissima* Gmel. ex Steud. *Nom. Bot. ed. 1.* 898. 1821; *Mayzea cerealis* Raf. *Med. Fl.* 2:241. 1830; *Mays americana* Baumg. *Enum. Stirp. Transs.* 3:281. 1840; *Zea mais* Alef. *Landw. Fl.* 303. 1866; *Thalysia Mays* Kuntze, *Rev. Gen.* 2:794. 1891.

2. Endosperm forms:

(a) Dent corn. — *Zea Mays quasquinensis* Bonaf. *Hist. Nat. Mais.* 37. 1836; *Zea Mays quillotensis* Bonaf. *l. c.* 38; *Zea Mays leucodon* Alef. *Landw. Fl.* 311. 1866; *Zea Mays xanthodon* Alef. *l. c.*; *Zea Mays pyrodon* Alef. *l. c.*; *Zea Mays dentiformis* Körn. *Syst. Uebers.* 23. 1873; *Zea Mays alborubra* Körn. *l. c.*; *Zea Mays flavorubra* Körn. *l. c.*; *Zea Mays crocodon* Körn. *l. c.* 24; *Zea Mays crocokeras* Körn. *l. c.*; *Zea Mays striatidens* Körn. *l. c.*; *Zea Mays rubrostriata* Körn. *l. c.*; *Zea Mays poikilodon* Körn. *l. c.*; *Zea indentata* Sturt. *Gard. Chron.* II. 20:443. 1883; *Maize*, 8. 1884. *Zea Mays cyanodon* Körn. in Körn. & Wern. *Handb. Getreid.* 1:362. 1885; *Zea Mays rubrovestita* Körn. *l. c.*; *Zea Mays rubrovelata* Körn. *l. c.*; *Zea Mays chilena* Körn. *l. c.* 375; *Zea Mays indentata* Bailey, *Cycl. Am. Hort.* 2006. 1902; *Zea Mays dentiformis leucoceras* Raybaud, *Compt. Rend. Soc. Biol.* 84:196. 1921.

(b) Flint corn. — *Zea Mays vulgaris* Bonaf. *Hist. Nat. Mais.* 31. 1836; *Zea Mays vulgaris aestiva* Bonaf. *l. c.*; *Zea Mays vulgaris autumnal* Bonaf. *l. c.* 32; *Zea Mays pensylvanica*

¹ Weatherwax, Paul. *Loc. cit.* 159. 1923.

² Each synonym is given but once in the following list, even though in some cases it is evident that the form designated might equally well be placed in another class, as is the case with some of the dwarf forms which are pod corns, or flint corns, or other types as well. Many of the original descriptions are very inadequate, and the names may be placed in groups to which others might have been preferred if a full description were available. It cannot be hoped that all varietal names are here noted, although a strenuous effort has been made to list all that have been published. The literature is voluminous and there is no index to varietal names comparable to the Kew Index of specific names.

Bonaf. *I. c.* 33; *Zea Mays canariensis* Bonaf. *I. c.* 34; *Zea Mays graeca* Bonaf. *I. c.*; *Zea Mays syrtica* Bonaf. *I. c.*; *Zea Mays subpraecox* Bonaf. *I. c.* 35; *Zea Mays hispanica* Bonaf. *I. c.*; *Zea Mays autumnna* Bonaf. *I. c.* 37; *Zea Mays virginica* Bonaf. *I. c.*; *Zea Mays rubra* Bonaf. *I. c.* 40; *Zea Mays versicolor* Bonaf. *I. c.*; *Zea Mays corynula* Alef. Landw. *Fl.* 307. 1866; *Zea Mays compressa* Alef. *I. c.*; *Zea Mays aestiva* Alef. *I. c.*; *Zea Mays autumnalis* Alef. *I. c.* 308; *Zea Mays crinusa* Alef. *I. c.* 309; *Zea Mays alba* Alef. *I. c.*; *Zea Mays quinquantina* Alef. *I. c.*; *Zea Mays pyrocarpa* Alef. *I. c.* 310; *Zea Mays striata* Alef. *I. c.*; *Zea Mays caesia* Alef. *I. c.*; *Zea Mays nigra* Alef. *I. c.*; *Zea Mays multicolor* Alef. *I. c.*; *Zea Mays latissima* Alef. *I. c.* 311; *Zea Mays leucoceras* Alef. *I. c.*; *Zea Mays pyroceras* Alef. *I. c.*; *Zea Mays vulgata* Körn. Syst. Uebers. 26. 1873; *Zea Mays vulgata autumnalis* Körn. *I. c.*; *Zea Mays vulgata macroxantha* Körn. *I. c.*; *Zea Mays vulgata pensylvanica* (Bonaf.) Körn. *I. c.*; *Zea Mays gilva* Körn. *I. c.* 27; *Zea Mays Philippi* Körn. *I. c.*; *Zea Mays rubropaleata* Körn. *I. c.*; *Zea Mays rubropunctata* Körn. *I. c.*; *Zea Mays violacea* Körn. *I. c.*; *Zea Mays rubroviolaceae* Körn. *I. c.*; *Zea Mays rubrocaesia* Körn. *I. c.*; *Zea Mays tristis* Körn. *I. c.*; *Zea Mays flavoalba* Körn. *I. c.* 28; *Zea Mays nigrorubra* Körn. *I. c.*; *Zea indurata* Sturt. Gard. Chron. II. 20:443. 1883; Maize, 8. 1884; *Zea Mays cyanea* Körn. in Körn. & Wern. Handb. Getreid. 1:363. 1885; *Zea Mays* var. *indurata* Bailey, Cycl. Am. Hort. 2005. 1902.

(c) Pop corn.—*Zea Mays rostrata* Bonaf. Compt. Rendu Acad. Sci. Paris 1:683. 1842; *Zea Curagua* Molina, Sagg. Chil. 129. 1782; *Zea hirta* Bonaf. Ann. Sci. Nat. I. 17:158. 1829; *Zea Caragua* Steud. Nom. ed. 2:797. 1841. sphalm.; *Zea mucronata* Poit. ex Vilm. in Rev. Hort. II. 5:245. 1844; *Zea Mays curagua* Alef. Landw. *Fl.* 305. 1866; *Zea Mays hirta* Alef. *I. c.* 309; *Zea Mays leucornis* Alef. *I. c.* 311; *Zea Mais glaucornis* Alef. *I. c.*; *Zea Mays rhodornis* Alef. *I. c.*; *Zea Mays haematornis* Alef. *I. c.*; *Zea Mays microsperma* Körn. Syst. Uebers. 24. 1873; *Zea Mays oryzoides* Körn. *I. c.*; *Zea Mays oxyornis* Körn. *I. c.*; *Zea Mays xanthornis* Körn. *I. c.*; *Zea Mays melanornis* Körn. *I. c.*; *Zea Mays rosea* Körn. *I. c.* 25; *Zea Mays lilacina* Körn. *I. c.*; *Zea Mays coerulea* Körn. *I. c.*; *Zea Mays rubronigra* Körn. *I. c.*; *Zea Mays poikilornis* Körn. *I. c.*; *Zea Mays mucronata* Wittmack, Zeitschr. Ethn. 12:95. 1880; *Zea everta* Sturt. Gard. Chron. II. 20:443. 1883. Maize, 8. 1884; *Zea Mays* var. *everta* Bailey, Cycl. Am. Hort. 4:2005. 1902.

(d) Soft corn.—*Zea Mays erythrolepis* Alef. Landw. *Fl.* 304. 1866; *Zea erythrolepis* Bonaf. Hist. Nat. Mais 30. 1836; *Zea macrosperma* Klotzsch, Bot. Zeit. 9:718. 1851; *Zea Mays mirabilis* Körn. Syst. Uebers. 22. 1873; *Zea Mays macrosperma* Körn. *I. c.*; *Zea amylacea* Sturt. Gard. Chron. II. 20:443. 1883; Maize, 8. 1884; *Zea Mays cuzcoensis* Körn. in Körn. & Wern. Handb. Getreid. 1:361. 1885; *Zea amyleasaccharata* Sturt. N. Y. Agr. Exp. Sta. 5th Ann. Rpt. (1886) 66. 1887; *Zea Mays* var. *amylacea* Bailey, Cycl. Am. Hort. 2006. 1902; *Zea Mays* var. *amylea-saccharata* Bailey, Cycl. Am. Hort. 2006. 1902.

(e) Sweet corn.—*Zea Mays rugosa* Bonaf. Hist. Nat. Mais 39. 1836; *Zea Mays saccharata* Körn. Syst. Uebers. 22. 1873; *Zea Mays dulcis* Körn. *I. c.*; *Zea Mays uberius* Körn. *I. c.*; *Zea Mays flavodulcis* Körn. *I. c.*; *Zea Mays rubrodulcis* Körn. *I. c.* 23; *Zea Mays coeruledulcis* Körn. *I. c.*; *Zea Mays vario-dulcis* Körn. *I. c.*; *Zea Mays striatodulcis* Körn. *I. c.*; *Zea saccharata* Sturt. Gard. Chron. II. 20:443. 1883; Maize, 8. 1884; *Zea Mays rubentidulcis* Körn. in Körn. & Wern. Handb. Getreid. 1:361. 1885; *Zea Mays lilacinodulcis* Körn. *I. c.*; *Zea Mays recens* Körn. *I. c.* 375; *Zea Mays atro-dulcis* Körn. *I. c.*; *Zea saccharina* Rollins, Horticulture 27:247. 1918.

3. Dwarf corn:

Zea Mays praecox Torr. in Eaton, Man. Bot. ed. 2. 500. 1818. *Zea Mays praecox*. Bonaf. Hist. Nat. Mais. 32. 1836; *Zea Mays*

minima Bonaf. *I. c.*; *Zea Mays cymosa* Bonaf. *I. c.* 38; *Zea Mays nana* Alef. Landw. *Fl.* 305. 1866; *Zea Mays leucopais* Alef. *I. c.*; *Zea Mays erythropais* Alef. *I. c.*; *Zea Mays glaucopais* Alef. *I. c.*; *Zea Mays poecilopais* Alef. *I. c.* 306; *Zea Mays gracillima* Körn. Syst. Uebers. 24. 1873; *Zea gracillima* "Hort." Bailey, Cycl. Am. Hort. 4:2004. 1902; *Zea minima* "Hort." Bailey, *I. c.*

4. Pod corn:

Zea Mays var. *tunicata* Larr. ex St. Hil. Ann. Sci. Nat. 16:143. 1829; *Mayzea vestita* Raf. Med. *Fl.* 2:241. 1830; *Zea cryptosperma* Bonaf. Hist. Nat. Mais. 30. 1836; *Zea vaginata* Sturt. Gard. Chron. II. 20:443. 1883; *Zea indentata* var. *vaginata* Sturt. Maize, 8. 1884; *Zea indurata* var. *vaginata*, Sturt. *I. c.*; *Zea Mays involuta* Körn. in Körn. & Wern. Handb. Getreid. 1:361. 1885; *Zea Mays* var. *vaginata* Sturt. N. Y. Agr. Exp. Sta. 3rd Rpt. (1884) 186. 1885. *Zea tunicata* Sturt. Bull. Torr. Bot. Club. 21:335. 1894.

5. Variegated-leafed forms:

Zea Mays japonica Körn. Syst. Uebers. 25. 1873; *Zea japonica* Van Houtte, *Fl. des Serres*, 16:121. 1868; *Zea Mays* var. *variegata* Nichols. Dict. Gard. 4:238. 1887; *Zea gigantea foliis-variegata* Nichols. Dict. Gard. 4:608. 1888; *Zea vittata* "Hort." Bailey, Cycl. Am. Hort. 4:2004. 1902. *Zea japonica* var. *vittata* "Hort." Bailey, Man. Cult. Pl. 104. 1924.

6. Ramose forms:

Zea Mays polystachytes Bonaf. Hist. Nat. Mais. 36. 1836; *Zea Mays ramosa* Schur, Oestr. Bot. Zeitschr. 9:11. 1859; *Zea Mays polyxantha* Alef. Landw. *Fl.* 306. 1866; *Zea Mays polerythra* Alef. *I. c.*; *Zea Mays polyleuca* Alef. *I. c.*; *Zea ramosa* Gernert, Am. Nat. 46:616. 1912.

7. Polysperm forms:

Zea Mays polysperma Blar. Compt. Rend. Acad. Sci. Paris 170:677. 1930.

8. Fossil form:

Zea antiqua Knowlton, Journ. Wash. Acad. Sci. 9:135. 1919.

9. Hybrid (teosinte x Maize):

Zea canina S. Wats. Proc. Am. Acad. 26: 160. 1891.

10. Miscellaneous or unidentified forms:

Zea minor Gmel. ex Steud. Nom. ed. 1. 898. 1821; *Zea praecox* Pers. ex Steud. *I. c.*; *Mayzea cerealis* var. *gigantea* Raf. Med. *Fl.* 2:241. 1830; *Zea Mays turgida* Bonaf. Hist. Nat. Mais. 34. 1836; *Zea Mays maxima* Hassk. Flora 25: Beibl. 1. p. 2. 1842; *Zea Mays pallida* Hassk. *I. c.*; *Zea Mays rubra* Hassk. *I. c.*; *Zea Mays minor* Hassk. *I. c.*; *Zea Mays minima* Hassk. *I. c.*; *Zea Mays hawarah* Hassk. *I. c.*; *Zea Mays acrogyna* Schur, Oestr. Bot. Zeitschr. 9:11. 1859; *Zea Mays excellens* Alef. Landw. *Fl.* 304. 1866; *Zea Mays pyracea* Alef. *I. c.* 307; *Zea Mays glaucops* Alef. *I. c.*; *Zea Mays europaea* Alef. *I. c.*; *Zea Mays americana* Alef. *I. c.* 310; *Zea Mays androgyna* Schur. Enum. Pl. Transs. 720. 1866; *Zea Mays humilis* Schur. *I. c.*; *Zea Mays leucosperma* Schur. *I. c.*; *Zea Mays perlata* Schur. *I. c.*; *Zea Mays microsperma* Schur. *I. c.*; *Zea Mays macrosperma* Schur. *I. c.*; *Zea Mays symetrica* Schur. *I. c.*; *Zea Mays tessellata* Schur. *I. c.*; *Zea Mays chinensis* Schur. *I. c.*; *Zea Mays tinctoria* OK. Taschen-Fl. Leipzig, 52. 1867; *Zea Mays acuminata* Körn. Syst. Uebers. 22. 1873; *Zea Mays pungens* Körn. *I. c.*; *Zea Mays diasacchara* Körn. *I. c.* 24; *Zea Mays turgida fasciata* Körn. *I. c.* 27; *Zea Mays dierythra* Körn. *I. c.*; *Zea Mays alboflava* Körn. *I. c.*; *Zea Mays leucodiasacchara* Körn. *I. c.* 28; *Zea Mays erythrodiasacchara* Körn. *I. c.*; *Zea Mays poikilodiasacchara* Körn. *I. c.*; *Zea Mays Peruviana* Wittmack, Zeitschr. Ethn. 12:95. 1880.

CHAPTER III

DESCRIPTIONS OF VARIETIES

GENERAL NOTES

The discussion of varieties in this publication refers primarily to sweet corn, *Zea Mays rugosa* Bonaf., although some mention is made of varieties in other groups or forms of maize grown in certain sections for the same purpose.

The data upon which the major descriptions are based were obtained in extensive variety trials over a period of five years. This work was started in 1928 and brought to completion in 1932. An earnest endeavor was made to grow at least one strain of each available variety each year and in many instances two or more strains of each of the leading varieties were grown for type comparison. In addition to this work, records were available in the annual reports of this Station for the years 1884 to 1886. These records represent Sturtevant's work and have proved to be of great value in the discussion of old varieties not grown today.

Various trial grounds, both of seed organizations and of agricultural experiment stations, were visited from time to time by one or more of the authors for the purpose of observing the same varieties under different conditions as well as to gain first-hand information on varieties not always successfully grown at Geneva. The gardens of J. B. Rice Seed Co., Cambridge, New York; Ferry Morse Seed Co., Detroit, Michigan; Associated Seed Growers, New Haven, Connecticut; Massachusetts State College of Agriculture, Amherst, Massachusetts; and Cornell University, Ithaca, New York, offered such opportunities.

The 24 full-page photographs of the white and yellow varieties serve to indicate the several types which have been in existence rather than to illustrate the leading varieties either historically or those grown in various sections of the country. Although some of the types shown are not true sweet corns, their use for this purpose in certain areas warrants their appearance in this publication. One plate is used to illustrate the variation existing in dry kernel characteristics of the crop.

Various methods of measuring differences and comparing similarities have been advanced by those interested in varietal studies. Each system has been devised to fit particular demands, and therefore is of value for the use intended. Much discussion has been brought forth concerning the merits or imperfections of each, but when considered from the standpoint of adaptability an effort should be made to appreciate the needs and recognize the scope of them all. Statistical analysis of plant, fruit, or root characters undoubtedly shows very definitely the average of a given group. Yet the multiplicity of the detailed measurements and consequent tedious interpretation of records, necessarily confines such work to relatively

few varieties. The number and code system is very definite and concise in its operation. When the note taker becomes thoroughly imbued with its exact meaning, the process of recording becomes quite mechanical. When used in conjunction with crops to which it is most suited, its value becomes definitely assured. It does not, however, lend itself with equal adaptability to all crops. This fact, together with the additional interpretation necessary before a clear account can be written, furthermore limits its possibilities for use when 200, more or less, varieties of several crops must be considered in a given season. In view of the limitations of previously used methods, a more easily applied system was devised to meet the requirements at Geneva. Its shortcomings are recognized, yet under our conditions, where a large number of varieties and strains must be grown for the project intended, it serves the purpose adequately.

The system for making and recording observations incident to the preparation of this monograph is based on four operations. The known description and origin of each variety and strain were carefully studied. The information derived from this study made it possible to arrange all seed samples in a definite numerical order based on similarity in type and number of days to edible maturity. Due to many unknown samples, the first year or so of the trials were not very successful in this procedure, but after preliminary knowledge concerning the comparative earliness of the varieties was obtained, a more perfect arrangement was possible. The various samples were planted in three 24-foot rows each, in order to insure good pollination. The arrangement in the field followed the numerical order mentioned above. This not only facilitated note taking, but rendered questionable strains and varieties readily available with those of like season for the purpose of comparison.

In order to determine more accurately when a given variety had reached a certain stage in its development, a system of tagging was devised. When at least 50 per cent of the individuals of a variety had attained a given stage of development, three normal plants were marked with numbered tags and the date recorded in a book made for the purpose. It was on these three individuals that the date records of the variety were considered. The trial ground was examined every day in order to determine when each tagged plant had reached a particular stage. Five stages were recorded, viz., tassel emergence (when the tassel started to emerge, but before the lateral spikelets began to unfold), pollen shed, silk emergence, milk period, and dough period. By this method the exact number of days between

various stages in representative individual plants could be ascertained. Thus the possibility of securing inaccurate records from general observation of any given stage was eliminated. The average of the three plants was determined and thereafter used as an index of the particular manifestation involved.

The recording of plant and ear characters was accomplished at definite periods on previously prepared descriptive cards. All possible characters of value were printed under the respective headings. At the time a given plant part had reached a certain stage, the appropriate terms referring to the part were underlined. By a system of checks, each character could be recorded in any one of seven degrees of intensity. This enabled the record sheet to be shortened to a minimum and still to retain an accurate account of the variety. From these cards, then, a correct description could be read directly. In as many instances as possible, characters were measured. This enabled the note taker at the conclusion of the trials to determine the range, select the classes, and include the types involved. Plant characters, with the exception of tassel and mature ear and kernel data, were recorded when the ears had attained the full milk stage. Ears were harvested from the center row if possible and taken to the laboratory before being described. In the fall, all remaining ears were harvested, husked, and six individuals selected to be brought in for mature ear and kernel notations.

The use of comparison records was found to be very helpful, especially in determining synonym possibilities. Ordinary large size composition books, in which were listed all varieties, were used from time to time throughout the season. Brief and outstanding observations concerning the similarities or differences of the varieties were noted in the field. Due to convenient cold storage facilities, ears in the milk stage of practically all varieties could be held and observed and comparisons noted at the same time. Later in the winter the mature ears were brought together, observations recorded, and comparisons made of this stage. The combination of all three stages on which comparison notes were taken offered exceedingly valuable clues in establishing synonyms or type relationship.

The choosing of a correct name to use for each variety has been given careful consideration. Whenever possible the principles applied in *Standardized Plant Names* have been observed; but inasmuch as names of varieties of vegetables are not listed in that work, it has been necessary for the authors to decide on the names without recourse to a standard guide. Where the recorded data have shown reasonably sure evidence of "identity" between two or more varieties, the authors have tried to preserve the name which seemed to offer the strongest case for its maintenance and have listed the others as synonyms.

Very often selections of a given variety differ only in minor respects. This condition has made it necessary to discuss many named forms in a comparative manner and not as distinct varieties. It is in this connection

that our judgment will be subject to argument and further trials will be necessary to settle the contended points.

The literature relating to the descriptions of varieties is, for the most part, of doubtful value and rather fragmentary in distribution. No monograph has been published that approaches the significance of those written in connection with certain other vegetable crops. Constant recourse has been made to various experiment station publications, journals, periodicals, books, and seed catalogs. These sources were of particular value in tracing the history and origin of varieties as well as in serving as an index for establishing a complete list of varieties to be used in our trials. When seed of these varieties was not available, the list served as a record of the progenitors of present-day varieties.

Since the corn plant is very easily cross fertilized, more or less variation exists within a given group or variety. Such a condition has made it difficult to record definite characters that would be of value in attempting a horticultural classification of this crop.¹ This fact is undoubtedly responsible for the lack of practical and reliable keys for sweet corn. The literature relating to the classification of sweet corn varieties is therefore limited to very general classes which, in themselves, offer little help insofar as identification is concerned.

The first classification of sweet corn varieties was published in the *Transactions* of the New York State Agricultural Society of 1848. In this account J. H. Salisbury arranged in a systematic order the various classes of maize based, first, on the physical and chemical characteristics of the dry kernel, and second, on the color of the kernel and cob. Only one class was devoted to sweet corn under which three varieties were discussed and an additional one of hybrid origin mentioned. The classification for sweet corn consisted of the following:

Class 5. Those the kernels of which are destitute of a farinaceous portion, and at maturity shrink or contract, giving a shriveled appearance to the epidermis.

A. Those with white kernels and a white cob.

(a) Small Early Sweet.

(b) Large Rhode Island Sweet.

B. Those with white kernels and a red cob.

(a) The Hematite Sweet.

Körnicker in 1873 classified sweet corn grown at Poppelsdorf, Germany, in five groups according to color of kernel.

In 1884, Sturtevant published a classification of the various types of maize. Three groups or races, as they were called, of sweet corn were established. These were designated by the first three letters in the alphabet and had as a basis for their separation the relative resistance of the varieties included to current hybridization as manifested by the color or kernel character type produced. Each race was given a synthetic description which included all varieties possessing in general the characteristics of the group. Race A included all 8-rowed varieties, race B all 12-rowed ones, and race C the many-rowed sorts. Such characters as plant size,

¹ The reader is referred to Chapter II for a discussion on the botanical classification of the plant.

shank size, ear shape, kernel shape and color, season, and natural climatic adaptability were indicated in the race description. In addition to the general separation according to races, each class was further divided into smaller groups based on cob and kernel color.

In 1886, Sturtevant's basis for race distinction was primarily based on kernel shape, namely, broader than deep, broad as deep, and deeper than broad. Each group was further classified into tribes designated by the Roman numerals I, II, and III, which had as their distinguishing features various ear conformations, namely, cylindrical, tapering, and fusiform. Other features of the classification remained the same.

With slight changes the same method was continued in his work published with the United States Department of Agriculture in 1899. At that time the terms race and tribe were discontinued and that of sub-groups substituted. The divisions of sub-groups had as their basis many variations of ear conformation and therefore greater opportunity for segregation was made available.

Burrill and McCluer, working at the Illinois Experiment Station, made three studies of sweet corn, the results of which were published as bulletins of that station. The first two, published in 1888 and 1890, respectively, had as the basis of classification the time required to reach edible maturity. Three classes, viz., early, medium, and late, were established, each of which was further segregated according to color of dry kernel into yellow, white, or colored other than yellow. The last study, which appeared in 1891, was identical with the previous ones as to classes with the exception of having an additional segregation based on the number of rows per ear. All varieties were accordingly classified as having either eight rows or more than eight.

The most recent classification of sweet corn was written by Byron D. Halsted and his associates at the New Jersey State Experiment Station in 1904. This study was based on the several characteristics of dry ears. The varieties were separated into three major divisions, namely, "(1) Those with the kernels of the common amber white color; (2) those of various other colors, and (3) those flint corns which on account of their earliness and productiveness are much grown for market purposes." The first and largest of these groups was segregated into the following classes: Distinctness of rows; cob color; number of rows; season; ear size and shape; and kernel size, shape, and wrinkling. The basis of classification of the other two major divisions, which included relatively few varieties, was determined according to kernel color and number of rows. This treatment of sweet corn classification proved to be the most detailed one yet proposed. Its limitations must be realized, however, since the work was based on only one season's results. No information relative to vegetative growth or that of ears in the edible milk stage was included. Since all factors should be taken into consideration for a systematic classification, this crop, at its best, is none too stable to be successfully adapted to such a study.

No attempt is made in this publication to develop a detailed classification or key for the identification of varieties. Since the crop is largely cross fertilized, the average in any one plant or ear character over a period of years tends to shift slightly. It is also obvious that environmental factors, such as soil fertility, heat, moisture, and geographical location, have considerable influence on such characters as plant height, vigor, days to maturity, wrinkling, and ear size. The large increase in the number of varieties and selections, as well as the newly developed and ever-increasing list of hybrid-inbreds and top crosses, have made the possibility of developing a specific classification even more remote.

In this study the arrangement of varieties is based primarily on color of the edible kernel. The names which constitute the list of those to be described or mentioned historically are divided into three sections, each presented in alphabetical order. The first group includes those sweet corns (*Zea mays rugosa*) possessing white kernels in the milk or boiling stage. Although a few varieties in this class, such as Black Mexican, Catawba, and Red Cory, have kernels that do not remain very long in the white stage, they may be considered in this group as the kernels are still white when in prime condition for consumption. The second group includes those varieties having yellow kernels at the milk or boiling stage; and the third, those varieties that are not true sweet corns (wrinkled seed) but which are well suited for growing in certain agricultural regions where they are gathered for eating when the kernels are in the milk. The latter group includes both white- and yellow-kernelled varieties distributed among the flint, dent, and flour forms.

In order to compile material on the histories of the varieties, it has been necessary to seek information from a large number of individuals. This information has been freely forthcoming and has greatly facilitated the accumulation of facts concerning the originators and introducers of many earlier varieties. Without this patient cooperation it is certain that much of the material presented here would have remained unearthed. The previously named seed organizations, together with the following, have cooperated to the fullest extent with the authors in furnishing both information and seed for trial: D. Landreth Seed Co., Bristol, Pennsylvania; W. Atlee Burpee Co., Doylestown, Pennsylvania; S. D. Woodruff & Sons, Orange, Connecticut; J. C. Robinson Seed Co., Waterloo, Nebraska; Western Seed and Irrigation Co., Fremont, Nebraska; and many others. The authors extend sincere thanks to individuals in the above-mentioned organizations, to many other individuals of the seed trade, and to co-workers at other institutions who remain unnamed because of lack of space.

A supplementary list of little known varieties is included on page 95. This group consists of varieties that were in existence a very short time, reliable records of which have not been available.

GLOSSARY OF TERMS

Anthesis The period of full development of the floral organs, here used specifically to refer to the time when the staminate flower is ready to shed pollen.

Beaked When the crown of the kernel is exceedingly rough and jagged so that at one point a projection is extended.

Broad oval When the side view of the kernel shows it to be definitely broader than long.

Butt The proximal portion of the ear; the end opposite the tip.

Capped When the tip of an ear is completely filled.

Color Anther colors are given in common color terms with the approximate Ridgeway term in parenthesis.

Complete whorl With reference to the presence of an entire circle of brace roots on one or more nodes.

Compound When the lateral spikelets of the tassel are abundantly divided.

Compressed When the rows of kernels at the butt end are compact and without indication of furrows.

Conical When the tip of an ear is distinctly cone-shaped.

Converging When the crown of the kernel assumes a triangular shape; not rounded.

Covered When the node is completely enclosed by the overlapping sheath.

Crease dented When the crown of the kernel is marked with a deep, narrow angular depression.

Crowded around cob When distinct pairs of kernel rows are not apparent; are uniformly distributed about the cob; ear entirely without longitudinal furrows or depressions.

Crown The top or tip of the kernel opposite the point of attachment.

Cylindrical A relative term used to indicate the resemblance in shape of a husked ear to a cylinder.

Dent corn Grain characterized by the presence of chit, with corneous matter on the two sides and starchy matter extending to the summit. By the drying and shrinkage of the starchy matter the summit of the kernel is drawn in or together and indented in various forms.

Double cross A hybrid between two single crosses ($A \times B$) \times ($C \times D$).

Drooping The position of a plant part when it bends towards the ground away from the erect axis.

Enlarged When the butt end of an ear is distinctly larger than the tip.

Erect The position of a plant part when it is perpendicular to the ground.

Expanded When the furrows at the base of the ear are much wider than at the tip.

Exposed When the tip of an ear shows an unfilled portion of the cob.

Feathery With reference to a very slender, frail, feather-like tassel.

Flint corn Grain characterized by the presence of corneous (flinty) material entirely surrounding the chit and starchy matter.

Furrows The space between two rows or two pairs of rows of kernels.

Horizontal The position of a plant part when it is at right angles to the erect axis.

Husk leaves The distal portion of the outside husks, usually darker green in color.

Husks long When the husks extend well over the tip of the ear.

Husks short When the husks scarcely extend over the tip of the ear.

Hybrid A general term used in plant breeding to designate a cross between two distinct varieties or two strains of the same variety.

Inbred A strain which has been self-pollinated. This makes possible the isolation of homozygous (pure) lines or forms (strains) which may be used as foundation stocks for the production by hybridization of improved varieties of maize.

Irregular When kernels are out of line with the rows.

Lost When there are more rows of kernels at the base of the ear than at the tip.

Margin The edge of the leaf.

Nubbin A small, often poorly developed ear.

Pairs distinct When a series of two rows of kernels do not fuse but each pair remains close together.

Pitted When the surface of the crown of the kernel is abundantly covered with very shallow, minute depressions.

Prominent node A condition under which the sheath fails to cover the node.

Rectangular When the shape of the kernel is similar to a rectangle.

Ridged With reference to a series of elevations, long in proportion to their width, present on any side of the dry kernels other than the crown surface.

Ring The annular band at the base of each bract, not present in all varieties.

Shank That portion of the ear that serves as a link between the cob and the plant; the ear stalk.

Simple When the lateral spikelets of a tassel are single and without sub-branches.

Single cross A hybrid between two inbred strains $A \times B$, an inbred \times inbred.

Smooth When crown of the kernel is free from wrinkling or other irregularities.

Smooth dented When the crown of the kernel is marked with a depression free from wrinkling.

Soft corn Grain characterized by the presence of chit and starchy matter, the corneous material being absent.

Sweet corn Grain characterized by the presence of chit and corneous matter, the latter translucent and wrinkled.

Tapering A term indicating a husked ear larger in diameter in the butt section than in the tip section.

Tip The distal portion of the ear; the point opposite the butt; the apex.

Top cross A variety (commercial) crossed with one inbred, variety \times inbred.

Triangular When the shape of the kernel is similar to a triangle.

Twisted When the rows of kernels spiral from the butt to the tip.

Wrinkled The presence of more or less coarse or finely divided corrugations on the surface of the crown of the kernel.

Zigzag With reference to the stalk; when the internodes bend alternately.

THE WHITE-KERNELED VARIETIES OF SWEET CORN

White-kerneled varieties of sweet corn represent not only the largest group but also the sorts first established and used as the basis for the many selections and crosses which have followed. Starting in 1779 with the name Papoon and Indian corn, during the next 50 years the list by Salisbury included 4 in 1848, 16 varieties described by Burr in 1863, and 33 by Sturtevant in 1884. For this study a total of 956 names of white varieties was found. It has been possible to investigate the great majority of these but after much research only the meagerest of information has been forthcoming for some of them.

The list of varieties expanded rather rapidly; at least to those growers who were the cultivators during the period of 1848 to 1933 and of course most rapidly

since the publication of Sturtevant's list in 1884. A writer in the *American Agriculturist* of 1864 was lead to say: "Sweet corn has run into a number of varieties, distinguished by their time of maturity, size of ear, and comparative sweetness." Nearly 30 years later, 1892, another commentator wrote, "the list of sweet corns is getting to be of wearisome length, but I do not see that any real improvement is being made." What would these individuals have written had they had the present list at their command?

The evolution of American varieties of sweet corn, which up to 1900 consisted almost entirely of whitekerneled sorts, has several distinct eras, largely based on popular opinion as to the most desirable sorts. The first varieties of which we have any record were small in plant and ear, the latter usually being 5 to 7 inches long and possessing 8 to 10 rows of kernels. Up to about 1890 earliness of season, usually associated with dwarfness of plant, was the major consideration that led to the success of a variety. Although a few large eared sorts were in existence at this time, recombinations from many crosses resulted in the production of almost every conceivable combination of number of rows, length and diameter of ear, color of cob and kernel, and size and shape of kernel. Such a mixture induced interested growers towards the selection of larger ears, which at the same time retained the desirable character of earliness. This was followed, and subsequently continued to the present time by the development of superior quality among varieties. With the introduction of Golden Bantam, the attributes of quality consisted of the additional factor of attractive color in the edible stage, as measured by consumer preference, as well as such characters as sweetness, flavor and tenderness of pericarp.

The justification for so divergent a collection of modern sweet corn varieties is presumably based on several factors. One of these is the localized market preference for certain varieties. New York City has long been partial to a very large ear, consequently such varieties as Stowell's Evergreen, Long Island Beauty and Late Mammoth are most popular in that as well as in other large eastern cities. The prevalence of the corn ear worm in certain sections has limited the number of varieties profitably grown to those that offer greatest morphological resistance to insect attack. Consequently such varieties as Oregon Evergreen and Alameda Sweet that have comparatively tight fitting husks at the tip, are retained in southwestern United States as most valuable for this purpose. The more northern areas of the United States must necessarily, because of shortness of season, confine the varieties to the extreme early ones. Such conditions, then, warrant the existence of Alpha, Dighton, Pickaninny, Early Dow, Aroostock Early and others. Similarly many varieties are brought into existence and continued because of their superior quality, even though certain other of their characteristics as size of plant, color of ear, etc., may not be exceptional. Likeness in one or more characters to an old time favorite, or the apparent resistance to certain

diseases and drought account for the existence of other varieties.

Abbott & Cobb's Early. Refs. 2, 345.

Abbott & Cobb of Philadelphia introduced this sweet corn in 1927. It was first discovered in Bucks County at their Pennypack Valley trial grounds growing in a field of Kendel's Early Giant. Subsequent trials showed its uniformity and remarkable adaptability to the growing conditions of that famous Philadelphia market gardeners' section. The Philadelphia region prefers a white corn of fair size, as will be noted in looking at the names of varieties listed by this company.

At Geneva edible ears were produced in 92 days, 12 days later than Mammoth White Cory, in season with Metropolitan and Early Evergreen, and 2 days earlier than Delicious. The plants are 1-1½ feet shorter than those of Metropolitan, less inclined to tiller but have equally as long tassels. The husked ears are 1-2 inches shorter, less plump, but contain 2-4 more rows of somewhat more narrow kernels.

Plant medium tall, 5-5½ feet; nodes 8-9, covered to slightly exposed; tillers few to none; tassel moderately long and rather coarse, 18-20 inches; lateral spikelets moderately many and crowded. Ears borne at 4th and 5th nodes, 1 and occasionally 2 ears per stalk. Husk leaves very few, short and light. Husked ear medium long, medium plump, 7-8 x 1¾-1⅞ inches; rows 12-14; kernels white; medium size; in dry stage as broad as long, nearly square.

Abolition. Ref. 217.

The catalog of James J. H. Gregory, Marblehead, Massachusetts, in the year 1885 briefly mentions this variety of good size, reputed to be sweet and tender, and suggests that it originated many years previous by crossing the Mexican with some standard white variety.

Acme. Refs. 22, 235, 238, 367, 368, 533, 535. Syns. De Wolf's Early Acme, Early Acme.

The Gurney Seed & Nursery Company of Yankton, South Dakota, found this new sort growing in the garden of M. J. De Wolf and introduced it in 1922 the year that kindly old gentleman celebrated his eightieth birthday. It is a heavy producer and is a rival of many varieties of field corn in this respect. A long ear of 12-14 rows is ready only a few days later in season than Golden Bantam. It has been continued by the Gurney Company as a valuable new creation of sweet corn and apparently has many friends in the northern plains region.

Alameda Sweet. Refs. 376, 380, 381. Syns. Alameda, Early Alameda, Early Improved Dwarf Alameda.

An early catalog of C. C. Morse & Co. (1907) of San Francisco listed this variety as Early Mammoth or Alameda. By some the name Early Mammoth is still carried, although present stocks are available which produce ears indicating a definite separation between the two. The actual originator of Alameda is not known, but its use in Alameda County, California, has been very general for many years. Market gardeners are believed to have developed the variety by selection from Early Mammoth, a deviation of the older Asylum corn.

There have been several improved lines developed by growers and seedsmen in California. The present

dwarf strain was cataloged first in 1924 and was the result of some selection work begun in 1920 by C. C. Morse & Co.

Edible ears were produced at Geneva in 87 days, which was about 10 days earlier than Early Mammoth and Stowell's Evergreen, about the same season as Howling Mob, and 3 days later than Kendel's Early Giant. The plants of Alameda were 2-2½ feet shorter than Early Mammoth, tassels shorter and more coarse, and ears 2-3 inches shorter with kernels more narrow and decidedly more crowded on the cob.

This variety has assumed greatest importance in California where it has been found by market gardeners to be one of the most adaptable to those climatic conditions. The tight wrapping of the husks about the tip is an important factor with corn growers in that area inasmuch as such protection reduces to some extent corn earworm injury.

Plant medium tall, 5-5½ feet; stalks medium heavy and slightly zigzag. Nodes 9-10, moderately covered to slightly exposed, not very prominent. Brace roots present, medium heavy, whorl complete and useful on one node. Tillers few, much shorter than central stalk. Leaves very long and moderately broad, 36-38 x 4-4½ inches; sheath equal to and occasionally slightly shorter than internode. Tassel moderately short and heavy, 15-16 inches, coarse, streaked with dark red at the base; terminal spike erect; lateral spikelets horizontal to slightly drooping, medium long, many, crowded; bracts green, sparsely striped with pale red; anthers variable in color; 66-68 days to anthesis.

Ears borne at 3rd and 4th nodes, one and occasionally two ears per stalk, otherwise one nubbin present. Shank short and decidedly heavy, 2-4 inches. Husks many, heavy, short, tightly wrapped and rather difficult to remove. Silk red, long and abundant. Husked ear moderately long and plump, 8-9 x 1⅞-2¼ inches, moderately tapering; base enlarged and usually compressed, occasionally somewhat open; tip abruptly conical and slightly exposed; rows 12-16, moderately straight, occasionally somewhat twisted at the base. Furrows occasionally present at base, deep and narrow.

Kernels at milk stage white, moderately narrow and deep; at dry stage dull white, longer than wide, moderately thin, 1.05 x .90 x .35 cm. (168 seeds per oz.); triangular; crown slightly rounded, surface rather abundantly and deeply wrinkled; set tightly on cob.

Albany. Refs. 22, 89, 91, 93, 238, 367, 368, 397, 405, 487, 508, 533, 535. Syns. Albany Sugar, Breck Premier.

This is another sort which served as a useful variety for a very limited period. It was listed about 1885 by Henry A. Dreer, Philadelphia, as belonging to the group of early varieties having more than eight rows. It apparently was very similar to Shakers Early, Perry's Hybrid, and Squantum. After 1892 the name no longer appeared in catalogs.

Plant medium tall, 5-6 feet; stalks moderately heavy; foliage abundant, dark green; tassel stiff; tillers many. Ears borne 24-30 inches from the ground; husk leaves moderately large, husked ears medium long and moderately plump, 7-8 x 1⅜-2 inches, moderately tapering, abruptly conical at the tip; rows 10-12, usually regular, crowded around the cob. Kernels at milk stage white, broad, shallow; at dry stage amber white, nearly as deep as broad, distinctly thick, nearly square; crown very slightly rounded; surface somewhat wrinkled; set loosely on cob.

Alpha. Refs. 335, 345, 348, 478.

Alpha was introduced in 1922 by D. M. Ferry & Co. of Detroit. For many years Ferry had been searching for a variety which would produce ears of fair size and

good quality and yet be earlier in season than Mammoth White Cory. After trying many crosses and selections at the Ferry experimental garden at Oakview, Michigan, a very promising stock was secured from W. B. Perry, a wellknown corn seed grower of Cresco, Iowa. This originated from a cross between Peep-O-Day and Extra Early Iowa. The new corn was the earliest in the trial grounds and was given the name Alpha, the first letter of the Greek alphabet, to suggest the first or beginning of anything.

Edible ears were produced in 75 days, about 2 weeks earlier than White Cory and 5 days later than Early Market. The plants are much like those of Early Dow and Aroostock Early, although slightly more slender. The ears are about the same length but slightly less strongly tapered. Its value is attributed to its earliness and as such is used to some extent by market gardeners and home garden enthusiasts in those areas where white corn is acceptable.

Plant short, 3¾-4 feet; stalks zigzag, and slender; nodes 6-8, prominent. Brace roots absent. Tillers usually absent, occasionally few, much shorter than central stalk. Leaves short and narrow, 24-26 x 2½-3 inches; sheath shorter than internode. Tassel moderately short and slender, 14-16 inches, occasionally dark red at the base; terminal spike erect; lateral spikelets nearly erect, few, short and rather scattered; bracts green, sparsely striped with light red; anthers buff colored (deep colonial buff to chamois); 52-55 days to anthesis.

Ears borne at 2nd and 3rd nodes, one ear per stalk with a nubbin usually present. Husk leaves few, short and very light. Husks few, rather thin, short and easily removed. Silk scanty and short. Husked ear moderately short and moderately slender, 6-7 x 1½-1⅝ inches, somewhat cylindrical and slightly tapering; rows 8, rather noticeably paired, straight, inclined to be slightly irregular at the base; furrows deep and narrow; base slightly enlarged, open; tip conical and exposed.

Kernels at milk stage white, medium size, moderately wide and medium depth; at dry stage dull white, medium size, .91 x 1.1 x .38 cm. (108 seeds per oz.); short oval in shape; crown slightly rounded; surface sparsely and rather coarsely wrinkled; set tightly on cob.

Amber Cream. Refs. 22, 61, 73, 74, 89, 91, 94, 214, 397, 411, 431, 446, 503, 507, 508, 510, 532, 533, 535, 536, 537. Syn. Amber Cream Sweet.

This good old sweet corn introduced in 1881 by W. Atlee Burpee & Co., Philadelphia, was a leading sort for 25 years. It was said to have come from a cross between Moore's Early Concord, a variety known since 1865, and Brigg's Early, one of the red cob Narragansett group. Crosses reported to have been made during this time were probably accidental, and the exact parentage was difficult to fix. J. A. Wilson, writing for the *Rural New-Yorker* in 1893 considered the variety as "very rich and sweet" and a "good late sort." After 1904 the name was dropped by Burpee.

Plant tall, 6-7 feet; stalk stout and vigorous. Tassel long and slender, lateral spikelets many, drooping, crowded. Ears borne 20-24 inches from the ground; husked ear medium long and moderately slender, 7-8 x 1½-1⅝ inches, nearly cylindrical to slightly tapering; base compressed, tip conical and exposed; rows 10-12, usually crowded, moderately straight, irregular at the base. Kernels at milk stage creamy white, at dry stage reddish to flesh color, rather small, as long as broad (155 seeds per oz.); blunt, triangular; crown slightly rounded; surface abundantly wrinkled

Aristocrat. Refs. 140, 238, 335, 345, 403, 460. Syn. Extra Early Aristocrat.

Aristocrat is a variation of Red Cob Cory from which it was selected. For many years the variety was controlled by the originator who supplied vegetables to the "aristocrats" and summer folk of Newport, Rhode Island. He was careful not to allow seed to get into the hands of his competitors. Thus, in having a monopoly on what was reputed to be the finest sweet corn that came to the market, he found no difficulty in disposing of all he raised.

After a few years the variety "escaped from bondage" and thereafter became more widely grown. Henry C. Anthony, a grower at Newport, grew seed for Henry A. Dreer of Philadelphia who offered seed to his customers in 1903, after he had attempted to develop the variety with a white cob. This was never quite accomplished, for Aristocrat is known today as a very desirable midseason pink cob variety. Early descriptions called attention to the "grains extremely sweet and sugary; being decidedly broad, to allow of easy scoring with a knife preparatory to buttering when eating from the cob."

Eighty-eight days were required for this variety to produce edible ears. This was 3 days later than Red Cory, one week later than Nuetta, about the same season as Howling Mob and 10 days earlier than Stowell's Evergreen. Considerable variation exists at the present time in plant and ear characters, but in general the plants are slightly taller and more stout than those of Red Cory, while the ears are plumper and possess greater variation in kernel color at the dry stage.

Plant medium tall, $5\frac{1}{2}$ – $5\frac{3}{4}$ feet; stalks moderately slender and slightly zigzag; nodes 8–10, slightly exposed, moderately prominent. Tillers moderately many, usually much shorter than central stalk. Leaves medium long and medium breadth, 30 – 32×4 – $4\frac{1}{2}$ inches; sheath equal to and occasionally shorter than internode. Tassel moderately long and slender, 18–20 inches, occasionally streaked with red at the base; terminal spike erect, lateral spikelets moderately drooping, moderately many, medium long and rather crowded; bracts green, heavily striped with dark red; anthers variable in color; 62–64 days to anthesis.

Ears borne at the 4th and 5th nodes, one and occasionally two ears per stalk. Husks moderately many, rather short and tightly wrapped. Husked ear medium long and medium plump, 7 – $8 \times 1\frac{1}{2}$ – $1\frac{3}{4}$ inches, partly cylindrical, moderately tapering; base expanded and somewhat open; tip long conical and slightly exposed; rows 8–10, moderately regular, occasionally paired, not crowded around the cob; furrows deep and wide on 8-row ears.

Kernels at milk stage creamy white, 8-row ears possess much wider kernels than 10-row ones, shallow; at dry stage variable in color from russet brown (burnt sienna) with part of the crown much lighter (honey yellow), to all (honey yellow); broader than long, $.98 \times 1.12 \times .44$ cm. (110 seeds per oz.); broad oval in shape; crown distinctly rounded; surface very sparsely and shallowly wrinkled; set very tightly on red cob.

Aroostock Early. Ref. 145.

Named for Aroostock County, Maine, by James A. Dunning of R. B. Dunning & Co., Bangor. This variety is popular in that state because of its earliness. The early history of the variety is unknown. Mr. Dunning had secured seed from a grower who had carefully selected and thoroughly acclimated it to that section with its short

growing season. It belongs in the group of early varieties with short slender ears and rather short stalk.

Edible maturity was obtained at Geneva in 70 days, 5 days earlier than Alpha, in season with Early Market and 3 days later than Pickaninny. The plants are much the same as those of Alpha and Early Dow, possibly somewhat taller than the former. The ears often have 10 rows instead of uniformly 8, as in Alpha, but otherwise are much alike. Because of its earliness it is used in the more northern areas, particularly in Maine, New Hampshire and Vermont, where the number of acceptable varieties is limited.

Plant moderately short, $4\frac{1}{2}$ – $4\frac{3}{4}$ feet; stalks slender, usually straight, some slightly zigzag; nodes 7–8, usually covered, not prominent. Brace roots not present. Tillers few, much shorter than central stalk. Leaves short and narrow, 24 – $26 \times 2\frac{3}{4}$ –3 inches; sheath usually equal to but occasionally shorter than internode. Tassel medium long and slender, 15–18 inches, occasionally streaked with red at the base; terminal spike erect, lateral spikelets nearly erect, moderately few, medium long; bracts green, moderately striped with red; anthers variable in color; 50–52 days to anthesis.

Ears borne at 3rd and 4th nodes, one ear per stalk, with nubbin present; husks medium in number, rather thick, easily removed. Husked ear moderately short and moderately slender, 6 – $7 \times 1\frac{1}{2}$ – $1\frac{3}{4}$ inches; moderately tapering; base expanded; tip conical and exposed; rows 8–10, paired in 8-rowed ears, not so evident in 10-rowed ones, straight, not crowded around cob; furrows often pronounced, deep and wide.

Kernels at milk stage white, medium size, broad and shallow; at dry stage dull white, distinctly broader than long, and medium thick, $.92 \times 1.32 \times .47$ cm. (96 seeds per oz.); short broad oval in shape; crown rounded; surface shallowly and rather sparsely wrinkled; set tightly on cob.

Asylum. Refs. 13, 14, 22, 73, 74, 89, 91, 238, 255, 397, 404, 405, 431, 435, 503, 507, 508, 515, 535, 536, 537, 538. Syns. Asylum Sugar, Old Asylum, Rhode Island Asylum.

Asylum as a variety name goes back to that group of sweet corns introduced during the early sixties. According to the *American Agriculturist* of 1864 it was first sent out by the Dexter Asylum at Providence, Rhode Island. The exact date cannot be fixed but since Burr in his "Field and Garden Vegetables of America," published in 1863, did not mention the variety, it probably was little known previous to that time. In the book on gardening written by Peter Henderson in 1867, four varieties of sweet corn were mentioned: Early Darling, Dwarf Prolific Sugar, Stowell's Evergreen and Asylum, the last said to possess every desirable quality except earliness.

The early history of many of these varieties can never be known. Salisbury in 1848 describes a large Rhode Island Sweet with 8-rowed ears. Between this period and 1863 Twelve-rowed Sweet, Old Colony and Stowell's Evergreen appeared. Undoubtedly there were other stocks grown privately that had not yet been brought to popular notice. Asylum and later similar varieties must have arisen either as selections from one of these named sorts, from an Indian source, or as the result of a cross of a known sweet corn with some field variety.

Credit for the introduction of this variety must go to J. M. Thorburn & Co., for in 1864 Orange Judd,



BEARSFOOT

(Three-quarters natural size)



BEST OF ALL

(Three-quarters natural size)

editor of the *American Agriculturist*, mentions Asylum in a short article on Indian corn varieties, and says, "The great privilege of testing the merits of the variety came because it was included among 15 tolerably well-known sorts laid on my table by the J. M. Thorburn Co." For 40 years after its introduction this variety remained a leading sort. In 1898 F. Wm. Rane of New Hampshire selected Asylum, Hances Early and Squantum from a test of 41 varieties as those having extra sweetness. During this period there were many selections introduced and many new sorts named that differed but little from the general type represented by Asylum.

Plant moderately tall, 6-7 feet; stalks heavy, with internodes long; leaves long and broad. Tassels long, lateral spikelets many, drooping, crowded. Tillers few. Ears borne rather high, 30-35 inches from the ground. Husked ear moderately long and moderately plump, 8-9 x 1 $\frac{3}{4}$ -2 inches, moderately tapering; base compressed, tip abruptly conical to rounded; rows 12, moderately straight and regular, not crowded around the cob, furrows deep and narrow. Kernels at milk stage white; at dry stage whitish amber, moderately large (121 seeds per oz.), about as long as broad, triangular, blunt at the base; crown rounded to nearly semi-circular; surface abundantly wrinkled; set rather loosely on cob.

Avon Evergreen. Refs. 129, 175.

This variety was named and introduced by D. M. Ferry & Co. of Detroit in 1913 and is of their own breeding, being a cross between Stowell's Evergreen and Late Mammoth. From the year of its introduction until 1922 it was featured by Ferry and also by W. E. Dallwig of Milwaukee as superior to Stowell's. The ear was cylindrical, about 9 inches long with 14 to 16 rows. As compared to Stowell's it was perhaps a trifle earlier with longer ear and thicker kernel.

Banana Cream. Refs. 147, 553, 555.

Seed of the variety Banana Cream was obtained by Oscar H. Will from a Mr. Harris, gardener of the H. Hollis Hunnewell estate at Wellesley, Massachusetts. As grown in North Dakota it was a rather late variety but was far better than others then grown and was, accordingly, introduced in 1897. Mr. George Will, who has watched its progress for 35 years, says, "It has undoubtedly changed considerably in earliness from being grown here in North Dakota for the past 35 years or more, but in general is about the same."

Eighty-six days were required for ears to reach edible maturity at Geneva. This was 2 days later than Kendel's Early Giant and 2 days earlier than Howling Mob. The plants are 1-1 $\frac{1}{2}$ feet taller than those of Howling Mob and decidedly more inclined to tiller, giving the plants a much more bushy appearance. The ears are 1-2 inches shorter, more slender, and distinctly more tapering, whereas the kernels are longer and thinner. It is one of the lesser known sorts and is very largely confined to the Northern Plains area where it has been reputed to remain in the edible state longer than most varieties. It produced very attractive ears at Geneva with kernels very uniformly arranged, thereby suggesting its usefulness in sweet corn breeding work.

Plant medium tall, 5 $\frac{1}{4}$ -5 $\frac{1}{2}$ feet; stalks moderately slender and straight; nodes 8-9, prominent, exposed; internodes occasionally streaked with red on exposed portions. Brace roots present,

slender and not very useful. Tillers many, giving plant a very bushy appearance, equal in height to central stalk. Leaves short and moderately narrow, 23-25 x 3-3 $\frac{1}{2}$ inches, midrib very broad and prominent, sheath equal to and shorter than internode. Tassel medium long and slender, 15-18 inches; terminal spike erect, lateral spikelets nearly horizontal, moderately few, short, scattered and occasionally branched at the base; bracts dark green, rather heavily striped with dark red; anthers reddish bronze (terra cotta and van dyke red); 60-62 days to anthesis.

Ears borne at 3rd and 4th nodes, one and occasionally two ears per stalk, one usually a nubbin; shank moderately short and slender, 3-4 inches. Husk leaves many, long, heavy and much darker than husks; husks short, rather light and tightly wrapped. Husked ear medium long and moderately slender, 7-8 x 1 $\frac{1}{2}$ -1 $\frac{3}{4}$ inches, decidedly tapering; base slightly enlarged and compressed, tip long conical and exposed; rows 12-14, straight, regular, very attractive, crowded around cob.

Kernels at milk stage white; at dry stage dull opalescent white, small, narrow, much longer than wide, noticeably thin, 1.0 x .81 x .31 cm. (172 seeds per oz.); distinctly triangular in shape; crown slightly rounded; surface very rough, rather coarsely and abundantly wrinkled, often deeply creased in parts; set moderately tight on cob.

Baltimore Market. Refs. 370, 403, 533.

Price & Drinkard describe this variety as a good mid-season corn of the coarse-grained sort. It was introduced in 1907 by Moore and Simon, Philadelphia, Pennsylvania, as the result of a cross between Southern Tuscarora and Roslyn Hybrid. This would account for its coarseness and poor quality. The vigorous growth of the plant and productive bearing habit made the variety a great favorite with Baltimore growers.

Bearsfoot. Refs. 22, 55, 75, 152, 181, 423, 435, 464, 507, 515, 533. Syns. Concord Bears-Foot, Rhode Island, Rhode Island Bearsfoot, Washington Bearsfoot, "Washington," "Washington Market." Illus. 20.

A favorite in the Boston market this was known for many years as Concord Bears-Foot. The name Washington or Washington Market sometimes appeared as a synonym of Bearsfoot but this name was not correctly used since it appeared more often in connection with Egyptian. The first listing of Bearsfoot was in the 1906 catalog of W. W. Rawson & Co., Boston. It was also listed by Joseph Breck & Co. and by W. E. Barrett Co., Providence, Rhode Island. The latter company offered the variety in 1933.

It was a popular sort in New England, somewhat on the order of Zig Zag Evergreen, with a smaller ear and less tendency to zig zag; the ear is broad or bear-footed on the end, and filled with fairly narrow deep grains of good quality.

Belle Isle. Ref. 286. Syn. New Belle Isle.

This variety is described in the catalog of S. M. Isbell & Co., Jackson, Michigan, as earlier than Peep O'Day but with larger ears produced higher up on the stalk. Isbell listed the variety in 1925 for the last time.

Best of All. Refs. 74, 116, 207, 208, 241, 278, 368, 404, 405, 454, 515, 533, 573. Syns. Silver Queen, White Bantam. Illus. 21.

This sweet corn has been known as Buckbee's Best of All since its introduction in 1894 by H. W.

Buckbee Co. of Rockford, Illinois. It is now 40 years old but the house of Buckbee continues to find it a leader among its customers.

Ninety-six days were required for ears to reach edible maturity at Geneva. This was 9 days later than Early Sweet and Crosby and 2 days earlier than Stowell's Evergreen. The plants are slightly shorter than those of Early Sweet and have a consistently greater tendency to tiller. The tassels are very much alike, both having much longer, more slender and feathery laterals than any other variety. The ears are similar to each other, but much longer and less tapering than Alpha.

Plant medium tall, $5\frac{1}{2}$ - $6\frac{1}{2}$ feet; stalks moderately heavy and straight; nodes 9-10, covered, not prominent. Brace roots absent. Tillers many, slightly shorter than central stalk. Leaves medium long and medium broad, $30-32 \times 3\frac{1}{2}-4$ inches; sheath longer than internode. Tassel medium long, slender and rather feathery, 15-18 inches; terminal spike erect to slightly drooping; lateral spikelets decidedly drooping, many, long, crowded and multi-branched; bracts and anthers variable in color; 70-72 days to anthesis.

Ears borne at 4th and 5th nodes, one and occasionally two ears per stalk, one usually a nubbin. Shank long and slender, 4-6 inches, often longer. Husk leaves many, long and heavy. Husks medium in number, moderately long, rather loosely wrapped and easily removed. Husked ear moderately long and slender, $8-9 \times 1\frac{1}{2}-1\frac{3}{8}$ inches, slightly tapering; base expanded and open; tip conical, slightly exposed and occasionally capped; rows 8, distinctly paired, moderately straight, slightly irregular at the base, not crowded around the cob; furrows deep and medium wide.

Kernels at milk stage white, medium size, broad and shallow; at dry stage, amber white, moderately small, wider than long and thin, $.9 \times 1.12 \times .37$ cm. (116 seeds per oz.); short oval in shape; crown rounded; surface very shallowly and sparsely wrinkled, often nearly smooth; set tightly on cob.

Big Four. Ref. 374. Syn. Wilkes Big Four.

Big Four sweet corn was sold on the local market in Los Angeles by Sam Wilkes for several years prior to its introduction in 1914 by the Morris & Snow Seed Co. of that city. According to catalog descriptions it was a vigorous grower 4 to 7 days later than Oregon Evergreen, ears larger than those of that variety and with tightly fitting husks. The last listing of the variety was found in 1927.

Black Mexican. Refs. 14, 17, 22, 61, 73, 74, 87, 89, 90, 91, 93, 94, 121, 214, 217, 238, 240, 241, 309, 328, 329, 335, 350, 367, 368, 388, 392, 397, 403, 407, 408, 411, 412, 414, 422, 423, 429, 435, 442, 487, 503, 507, 508, 511, 512, 513, 525, 533, 535, 536, 537, 538, 544. Syns. Black Mexican Sweet, Black Sugar, Black Sweet, Black Sweet Corn, Early Mexican Sweet, Extra Early Black Mexican, Improved Black Mexican, Mexican, Mexican Black Sugar, Mexican Sweet. Illus. 24, 25.

It has been said that "no farm in America fulfills its mission without a field of corn and no Yankee could feel at home without an ear of sweet corn if he had ever lived in the country." Likewise the epicurean of vegetable morsels may not rest in his search for the acme of all sweet corn until he has eaten Black Mexican fresh from the field. The Hon. J. J. H. Gregory said of this variety in 1875, "it is

the sweetest and tenderest for table use of all varieties I am acquainted with." It is true that the ear is black at full maturity and while it may not look so well upon the table as the white or yellow kinds, after tasting it one forgets all prejudices against color and takes another ear.

The name Black Mexican implies that it came from Mexico; it is not mentioned by Salisbury in 1848, by Bement in 1853, or by Klippart in 1858. Under the name Black Sweet it was described by Burr in 1863. James J. H. Gregory of Marblehead, Massachusetts, listed this in 1863 in his retail catalog of garden vegetables under the name Mexican Sweet. A special circular describing the new introduction was sent out but we have been unable to locate a copy. The several lists of Indian corns have been inspected but no mention of a black sweet corn has been observed. There are, however, numerous varieties of flour and dent corns which are listed as blue, black or purple. A statement from the "Iroquois Uses of Maize and Other Plants" by Parker says, ". . . the Indians had just left their kettles on the fire boiling fine corn and beans which we got, but what was most remarkable—the corn was all purple . . ."

Sturtevant in describing 33 varieties of sweet corn in 1884 listed both Black Mexican and Black Sugar, saying "there is no distinction in the catalogs of seedsmen, they are usually grown together, the seeds from the same source yielding both varieties, which can be readily separated." Throughout the period when sweet corns have increased from a mere handful to a thousand and more names there have been but few black varieties noted, the variety under discussion, Pickaninny and Peters Black, a black variety grown in Nova Scotia. George F. Will, who has studied the Indian types so thoroughly, in a letter to the authors, says, "As regards Black Sweet corn, I have found that this is very readily produced when either natural or intentional crosses occur between the black or very dark blue flint or flour corn varieties and any of the sweet corn varieties." There was and probably is a black variety of sweet corn somewhere in the Indian settlements of the southwest, which was the progenitor of Black Mexican.

Edible ears were produced at Geneva in 86 days, 18-20 days later than Pickaninny, the only other black sweet corn variety of importance, in season with Crosby and 2 days earlier than White Cory. The plants are decidedly taller and much lighter green in color than those of Pickaninny, whereas the tassels and anthers are similar in color. The pale green foliage and correspondingly light green tassels serve to distinguish it from most varieties on the basis of plants. The ears are one-third to one-half again as long as those of Pickaninny and are somewhat more tapering. The kernels are also longer and broader.

Black Mexican has long had the reputation of being the sweetest and most tender variety that could be grown. If it were not for the sudden change in color of the young kernels to various shades of purple and bluish black, this sort would undoubtedly be used much

more extensively than it is at present. Home gardeners must watch carefully the development of the kernels, since they are ready for cooking several days before they show color and remain sweet and tender for several days afterwards. It has created considerable popularity in the home garden where its high quality has been appreciated. Certain geneticists have used it in order to increase the quality of various sweet corn hybrids in their breeding projects.

Plant medium tall, $5\frac{1}{4}$ – $5\frac{3}{4}$ feet; stalks moderately slender and straight; nodes 10–12, covered, not prominent. Brace roots occasionally present, slender, not very useful. Tillers few, about $\frac{1}{2}$ as tall as central stalk. Leaves medium long and moderately narrow, 28–32 x $3\frac{1}{4}$ – $3\frac{1}{2}$ inches; decidedly pale green in color; sheath longer than internode. Tassel moderately short and rather heavy, 15–16 inches, distinctly pale green in color; terminal spike erect; lateral spikelets horizontal to slightly drooping, branched, many present and crowded; bracts pale whitish green striped with slightly darker green; anthers uniformly pale yellow (pinard yellow); 64–66 days to anthesis.

Ears borne at 4th and 5th nodes, one and often two ears per stalk. Shank moderately short and slender, 2–4 inches. Husk leaves few, very short and light. Husks medium in number and length, tightly wrapped, not easily removed. Silk moderately long but scanty, uniformly pale green in color. Husked ear medium long and moderately slender, 7–8 x $1\frac{3}{8}$ – $1\frac{5}{8}$ inches, partly cylindrical and slightly tapering; base slightly open; tip conical and slightly exposed; rows 8, very often paired, straight, regular; furrows deep and narrow.

Kernels at milk stage white, very soon changing to bluish black in late edible stage; rather large, moderately broad, shallow and rather thin; at dry stage dull black, occasionally with a slate-gray tinge; broad as long, medium thickness, 1.1 x 1.2 x .40 cm. (76 seeds per oz.); broad oval in shape; crown rounded, almost semi-circular; surface abundantly, finely and rather deeply wrinkled; set moderately tight on cob.

Bonanza. Refs. 22, 90, 91, 220, 290, 328, 367, 368, 508, 509, 512, 513, 514, 533. Syns. Early Bonanza, Extra Early Bonanza, New Bonanza, New Early Bonanza, Sweet Bonanza, Sweet Early Bonanza.

This variety, one of many to be introduced soon after 1890, combined size with earliness. Apparently it was introduced simultaneously in 1892 by both Johnson & Stokes of Philadelphia and A. W. Livingston's Sons, Columbus, Ohio. Its origin is credited to a Philadelphia gardener who "astonished" his brother gardeners by having such early big corn. Some sources give the variety as a synonym of Squantum but no clean cut record is available of its early history.

The dry ears were 12-rowed, about 6 inches long, $1\frac{3}{4}$ inches in diameter and contained abundantly wrinkled, long white kernels loosely set on a whitish cob.

Boston Market. Refs. 90, 91, 122, 218, 240, 508, 533.

Syns. Boston, "Crosby's Early Sugar," "Crosby Extra Early," Early Boston Market.

This variety was really listed as Crosby's Extra Early Sugar, or Boston Market ("Josiah Crosby Strain") in 1892 by W. W. Rawson, Boston, Massachusetts. The ears of this strain were smaller and less pointed than the Early Crosby which later became the permanent representative of this type. Although similar in name, it was quite different from Early Boston Market offered and described by Gregory in 1890. The latter supposedly

came from Crosby but had a much longer or larger ear of 10–12 rows and rather coarse kernels. It had quite a run for a few years, but had no real merit as a table corn.

Branching. Refs. 85, 345, 348, 534. Syn. Abundance.

This variety originated with T. C. Kevitt of Athenia, New Jersey, who perfected the strain by careful breeding until it was released to W. Atlee Burpee Co. and introduced in 1928. The ability to produce a large number of ears per plant has not been a major characteristic of most of the varieties of sweet corn. One to two ears per stalk is the consistent record throughout the list. Burpee's Branching when introduced in 1928 was promoted as a sensational new sweet corn because of the consistency with which the plants produced 3 to 6 ears per stalk. Pictures of plants showing 6 ears from one seed are shown in the catalogs which indicate that this production is the result of a strong branching habit of the plant.

Early records show that in 1871 and 1872 a variety known as Judson's Branching Sugar was listed by Thorburn, Gregory and Vick. This corn was evidently a field variety but produced from 3 to 5 ears per stalk.

Edible ears were produced at Geneva in 92 days, in season with Early Evergreen, 6 days earlier than Egyptian and 5 days later than Crosby. Plants are $1\frac{1}{2}$ feet shorter than those of Egyptian with a decidedly greater tendency to tiller, and having tassels much more slender and delicate. The ears are 2–3 inches shorter than those of Egyptian, have 2–4 less rows, but possess kernels that are very similar in size, shape and degree of whiteness both in the milk and mature stages. Altho the name implies the production of several ears per plant, no abnormal condition was found to exist in trials at Geneva. The ears have, however, been found to be exceedingly attractive and uniform in shape and size. It is one of the few late varieties with small ears and kernels. Those growers interested in the production of moderately late corn that is not of colossal size will find this one pleasing.

Plant moderately tall, 6– $6\frac{1}{2}$ feet; stalks slender and moderately straight; nodes 10–12, covered, not prominent. Brace roots present, slender, whorl incomplete, partially useful. Tillers very many, equal to and occasionally slightly shorter than central stalk. Leaves medium long and moderately narrow, 30–32 x $2\frac{3}{4}$ – $3\frac{1}{2}$ inches; sheath longer than internode. Tassel medium long and slender, 16–18 inches, often streaked or solid red at the base; terminal spike erect; lateral spikelets horizontal to slightly drooping, many present, medium long, crowded; bracts green, sparsely striped with red; anthers variable in color; 70–72 days to anthesis.

Ears borne at 4th to 6th nodes, two ears per stalk with an additional nubbin usually present; shank short and very slender, 2–3 inches. Husks few, light, medium length, wrapped loosely and easily removed, often lightly tinged with pale red along the margin of exposed area. Silk abundant, moderately long and rather easily removed. Husked ears moderately short and moderately slender, 6–7 x $1\frac{1}{2}$ – $1\frac{5}{8}$ inches, moderately tapering; base compressed; tip abruptly conical and usually capped; rows 12, moderately straight, slightly irregular and twisted at the base, crowded around the cob.

Kernels at milk stage white; small, narrow and medium deep; at dry stage opalescent white, moderately long and narrow, thin, 1.15 x .97 x .41 cm. 132 seeds per oz.; triangular; crown slightly

rounded, occasionally somewhat converging; surface sparsely and coarsely wrinkled; set slightly loose on cob.

Broad Grained, Livingston's. Ref. 324. Syn. Broad Grained. Illus. 25.

The existence of so many varieties of sweet corn is based on the actual measurable differences which exist in season, ear, or plant. This variety, introduced by the Livingston Seed Co. of Columbus, Ohio, about 1906, is as the name indicates, one with the broadest kernel of all sweet corns. It was selected for this character for several years prior to its introduction; moreover, the variety exists today in about its original form. The original corn from which Broad Grain was selected is not known, but the type is represented by Triumph which has been in existence since 1874. As first advertised it was offered to those who "enjoy running a knife blade down through the rows of grains before eating, there would be no dodging of the knife about the big grains."

At Geneva edible ears were produced in 99 days, about the same season as Stowell's Evergreen, 2 days later than Country Gentleman and 1 or 2 days earlier than Late Mammoth. The plants are equal in height to those of Stowell's Evergreen, the tassels being slightly longer and having laterals that are longer and more drooping. The ears are slightly longer and more slender, having kernels that are distinctly broader and shorter than Stowell's. This is the largest and latest 8-rowed sweet corn grown today.

Plant tall, $7\frac{1}{2}$ – $7\frac{3}{4}$ feet; stalks moderately heavy and straight; nodes 10–12, somewhat exposed, moderately prominent; internodes slightly streaked with red on exposed portions. Brace roots present on one node, quite heavy and useful. Tillers moderately few, nearly as tall as central stalk. Leaves moderately long and broad, 32 – $34 \times 3\frac{1}{2}$ – 4 inches; sheath equal to and often slightly shorter than internode. Tassel long and heavy, 21–22 inches; terminal spike erect to slightly drooping; lateral spikelets slightly drooping, many present, long, slender branched and moderately crowded; bracts green, moderately striped with red; anthers buff (pinard yellow to chamois); 72–74 days to anthesis.

Ears borne at 5th and 6th nodes, often two ears per stalk, one occasionally a nubbin. Husks few and thick, short, rather tightly wrapped, difficult to remove. Husked ear long and medium plump, 9 – $10 \times 1\frac{7}{8}$ – 2 inches; partly cylindrical and slightly tapering near tip; base slightly expanded and open; tip conical, slightly exposed to capped; rows 8, occasionally paired, straight; furrows moderately deep and narrow.

Kernels at milk stage white, large, broad and shallow; at dry stage dull creamy white, distinctly wide, medium depth and thickness, $1.0 \times 1.3 \times .36$ cm. (92 seeds per oz.); short broad oval in shape; crown rounded; surface shallowly and coarsely wrinkled; set tightly on cob.

Burbank Early Maine. Refs. 16, 22, 23, 90, 91, 94, 99, 105, 107, 121, 238, 291, 328, 329, 350, 367, 368, 403, 411, 508, 510, 511, 515, 533, 536, 537, 538. Syns. Burbank Early, Burbank Early White, Early Maine, June 21st, Maine.

This variety came from the state whose name it bears, and whose latitude is an indication of earliness in all vegetation. E. W. Burbank, the originator, selected from Cory a type with larger ear, pure white cob with rich cream white kernel. Vaughan's Seed Store in 1891 was the introducer, and the variety

was featured for several years by many of the seedsmen. Although not grown in trials at Geneva, experimental trials in other northern states indicate that edible maturity could be reached in about 80 days from the time of planting.

Plant moderately short, $4\frac{1}{2}$ – $5\frac{1}{2}$ feet; stalks moderately heavy. Tillers usually absent. Tassel short and stiff; laterals simple. Ears borne low, 10–14 inches from the ground; husked ears moderately short and moderately plump, especially at the base, 6 – $7 \times 1\frac{3}{4}$ – 2 inches; distinctly tapering; base enlarged and often expanded; tip conical and fairly well filled; rows 8, rather irregular, with furrows prominent at the base. Kernels at milk stage white, medium size, broader than long; surface rough and irregular, usually coarsely wrinkled.

Burr's Improved. Refs. 9, 14, 87, 271, 272, 433, 491, 507, 508, 524, 533. Syns. Burr's Large Sweet or Sugar, Burr's Mammoth, Burr's Mammoth Sugar, Burr's New Sugar, Burr's Sweet.

The name "Burr's Improved Wrinkled Sweet Corn" occurs in the U. S. Patent Office report for 1855, page 165, where a comparative analysis of the corn cobs of 4 field corns and of 2 sweet corns was given. Burr in 1863 began his description of Burr's Improved (Syn. Burr's Sweet) with the sentence: "An improved form of the Twelve-rowed Sweet. The ears are from 12 to 16 rowed, rarely 18."

The name Twelve-rowed Sweet would seem to be a rather definite term but early descriptions of the corn grown under this name describe ears of from 10 to 16 rows. Wm. Charlton who in 1857 wrote a short essay on sweet corn for *The Horticulturist* describes Twelve-rowed Sweet: "This is rather short and small in the cob, averaging from 12–16 rows, deep not large seeds, fleshy, lightest yellow color when cooked." It would seem, therefore, that the Twelve-rowed Sweet was considerably mixed for ear type and number of rows and that selection could easily have been made which might have resulted in several new varieties based on a definite number of rows.

There must have been a progenitor of this 12–16 rowed corn, but we must admit failure to find an original source. From a rather brief history of sugar cane written about 1855 we find this paragraph: "The earliest records we have of the sugar-cane (if we except a slight allusion by the prophet Job) are found in the writings of authors who lived 3 centuries before the Christian Era. From them, we simply learn that the history of this plant, like that of many other necessities of life was involved in obscurity." This applies to the history of many varieties of sweet corn, among them Burr's Improved and its supposed precursor, Twelve-rowed Sweet. They came, but just how and just when is not known. The type continued, and the names to represent the type expanded like the fins of a fan. The basis for the following description is largely that secured from the work of Sturtevant and other early workers.

Plant tall, 7–8 feet; stalks heavy and straight. Ears borne 30–36 inches from the ground. Husked ears long and very plump, 8 – 10×2 – $2\frac{1}{4}$ inches, slightly tapering; tip rounded and nearly capped; rows 12–16, rarely 18, usually straight and regular, crowded around the cob. Kernels at milk stage white, broad and deep;



BLACK MEXICAN

(Natural size)



at dry stage dull, yellowish, semi-transparent, white, large, longer than broad; 108 seeds per oz., nearly rectangular in shape; crown nearly straight; surface abundantly and deeply wrinkled; set very loosely on cob.

California. Refs. 106, 120, 513, 514. Syn. *California Sweet*.

For several years following its introduction in 1893, John Lewis Childs of Floral Park, New York, offered this as a late variety with ear of enormous size. One grower from Massachusetts wrote, "Its only fault is its size; to eat it from the cob requires a mouth like a crocodile."

Catawba. Refs. 28, 39, 82, 531. Syn. *Earliest Catawba*. Illus. 25.

Earliest Catawba was originated by the Rev. J. E. Tinker, Rock Stream, New York, at his home overlooking Seneca Lake. For 15 years after crossing a white variety with Black Mexican, Tinker carefully selected ears for extreme earliness and uniformity. In 1906 he sent a few ears to David Burpee for testing at Fordhook farms. Burpee's gardeners were so pleased with the distinct character and fine quality of the sample that a visit was made to Mr. Tinker's garden and arrangements made for the entire seed crop. W. Atlee Burpee & Co. of Philadelphia introduced *Catawba* in 1909 as "the first real rival yet discovered to our famous Golden Bantam."

Rock Stream, New York, is located in the grape belt of the beautiful Finger Lakes region of central New York. The color of the ear of *Catawba* when dry, a dark purple shaded with red, is very much like the color of the *Catawba* grape from which came its name. The entire plant, stalk, tassels, blades or leaves, and the other husks on the ear are shaded heavily with dark red. This reddish coloring on the stalks and blades of the sweet corn plant has been valued by old gardeners as a sure indication of the finest flavor.

Eighty-two days were required for this variety to produce edible ears at Geneva. This was 3 days earlier than *Red Cory* and 5 days later than *Surprise*. The plants are about 1 foot taller than those of *Honey Dew* and possess about the same amount of red coloration along the margin and midribs of the foliage. The ears are borne on shanks considerably longer than those of *Honey Dew* while the husk ears are about the same length but slightly plumper. The edible kernels remain white for a very short time, soon turning various shades of deep red to maroon. The color change characteristic of *Catawba* has presented the same difficulty with reference to marketing the product as did *Black Mexican*. On the whole it has not enjoyed the universal approval based on quality that the black sweet corn has, and is therefore usually considered for the home garden.

Plant medium tall, 5-5½ feet; stalks moderately slender and zigzag; nodes 9-10, slightly exposed and moderately prominent; internodes solid red over the surface. Brace roots usually not present. Tillers many, equal to central stalk in height. Leaves medium long and medium broad, 28-30 x 3½-4 inches, colored at the margin; midrib medium width, red, very prominent; pubescence very dense almost fuzzy at union of sheath and blade; sheath equal to and occasionally longer than internode, heavily streaked, almost

solid dark red. Tassels moderately short and slender, 15-16 inches, entire tassel deep red in color; terminal spike drooping; lateral spikelets horizontal to slightly drooping, moderately many and crowded; bracts dark green, heavily striped with a dark red, also a narrow dark green ring at the base; anthers uniformly yellow (pinard yellow); 63-64 days to anthesis.

Ears borne at 3rd and 4th nodes, one and occasionally two ears per stalk, one usually a nubbin. Shank moderately long, 4-5 inches, slender and brittle. Husks medium number, thin, very long, rather tightly wrapped, exposed portions red, inner ones dark green. Silk scanty, moderately long and uniformly pale amber green in color. Husked ear moderately short and moderately slender, 6-7 x 1½-1¾ inches, partly cylindrical and slightly tapering; base slightly enlarged and expanded; tip broadly conical to rounded, slightly exposed to capped; rows 8, occasionally paired, moderately straight, often irregular at the base; furrows deep and moderately narrow.

Kernels at early milk stage silvery white but soon having various shades of red, moderately wide, and medium shallow; at dry stage dark reddish purple (dark vivid purple), also some nearly black, small, shorter than wide, .93 x 1.1 x .41 cm. (100 seeds per oz.); short, broad oval in shape; crown rounded, almost semi-circular; surface finely and abundantly wrinkled; set tightly on cob.

Champion. Refs. 22, 97, 121, 221, 238, 240, 241, 350, 403, 405, 456, 513, 514, 515, 517, 518, 533. Syns. *Champion Early*, *Champion Sugar*, *Improved Early Champion*, *New Champion*, *New Early Champion*.

In a letter from Henderson, the origin of *Champion* is credited to Everett B. Clark of Milford, Connecticut. It was introduced by Vaughan's Seed Store, Chicago, in 1894 and was soon listed by most of the leading seed houses of that period. Vaughan continued to list it until 1931 but its period of greatest popularity was during the first 10 years of its existence. Favorable reports of its performance were received from all parts of the country and these encomiums and trial ground records led Henderson to install the variety as a leader among the medium early corns. As originally introduced, it seems to have been a 12-rowed variety, but Rice in 1918 describes *Champion* as 2 weeks later than *Mammoth Cory*; ears large, 14 to 16 rowed, with broad grains of fair quality.

Chase, The. Ref. 165.

A small eared variety similar to *Cory* in earliness, but with foliage heavily shaded with dark red. It was first offered by R. & J. Farquhar & Co. of Boston in 1913, and discontinued in 1918.

Chicago Market. Refs. 22, 89, 91, 121, 126, 137, 238, 274, 367, 368, 397, 412, 487, 508, 514, 533, 535, 536, 538. Syns. *Ballard*, *Ballard's Early*, *Ballard's Extra Early*, *Ballard Red Cob*, *Chicago Early Market*.

This is one of the older varieties, introduced about 1890 and having a run of popular notice until 1910. It was listed by Vaughan in 1889 and by Burpee in 1892. Neither the originator nor the introducer are known but according to a brief write-up in the catalog for 1892 of the Mohawk Valley Seed Co., Canajoharie, New York, it was a cross between *Early Pratt* and *Moore's Concord*. This would account for the occasional appearance of a pink cob. The variety was sometimes listed as *Ballard's Early* and the name *Ballard Red Cob* occurs in the 1894 catalog of the Perry Seed Store, Syracuse, New York.

Plant short, 4-4½ feet, stalks slender; tassels short, stiff, slender and simple. Tillers few, much shorter than central stalk. Ears borne low, 12-15 inches from the ground; husked ear short and moderately slender, 5-6½ x 1½-1⅝ inches, nearly cylindrical; tip abruptly tapered; rows 12, straight, regular, crowded around the cob. Kernels at milk stage white to pale flesh color, moderately broad, shallow; at dry stage very pale pinkish red; nearly white, rather small, nearly as long as broad, broad ovate; crown slightly rounded; surface very sparsely and shallowly wrinkled, nearly smooth.

Cincinnati Market. Ref. 336. Syns. Club Zig Zag, Club Zig Zag Evergreen. Illus. 25.

The J. M. McCullough's Sons Co., Cincinnati, Ohio, introduced this new variety in 1922. Three years later it was offered by the J. Chas. McCullough Seed Co., also of Cincinnati. Other than the fact that this variety originated in the Cincinnati market area, information on its history is not available. The term zig zag is perhaps descriptive in relation to the kernel pattern of the ear but it is somewhat confusing because of its former use for Zig Zag Evergreen, a much older and different variety.

At Geneva this was the latest white sweet corn to come into production, 103 days being required to reach edible maturity. This was 6 days later than Country Gentleman and 5 days later than Late Mammoth and Long Island Beauty. The plants are more stocky and have shorter internodes than those of Country Gentleman giving them the appearance of being more leafy. The foliage appears to be somewhat lighter green in color. The ears are 1½-2 inches shorter and much less tapering than those of Country Gentleman; likewise the kernels are distinctly thicker, less tapering, and usually not as deep.

Plant tall, 7-7½ feet; stalks straight and heavy; nodes 14-16; covered, not prominent. Brace roots present, rather slender, whorl complete on one node, useful. Tillers few, somewhat shorter than central stalk. Leaves moderately long and medium broad, 32-34 x 3½-4½ inches; sheath distinctly longer than internode. Tassels moderately long, 18-20 inches, rather heavy, coarse and bushy; terminal spike erect; lateral spikelets nearly horizontal, very many present, distinctly crowded, multi-branched; bracts green, moderately striped with red; anthers buff (deep colonial buff to chamois); 74-76 days to anthesis.

Ears borne at 6th and 7th nodes, one and often two ears per stalk, one usually a nubbin. Shank short and medium heavy, 2-3 inches. Husk leaves few, short and distinctly light. Husks many, medium long, heavy, thick, tightly wrapped and difficult to remove. Silk very abundant, long and uniformly red, difficult to remove. Husked ear medium long and moderately plump, 6½-7½ x 1¾-2 inches, moderately tapering; base compressed; tip abruptly conical, somewhat exposed; rows absent.

Kernels at milk stage white, medium size, narrow and thick, moderately deep; at dry stage dull white, much longer than wide, very thick, 1.15 x .70 x .52 cm. (160 seeds per oz.); cuneate; crown very slightly rounded; surface deeply and abundantly wrinkled; set loosely on cob.

Cleveland's Colossal. Refs. 94, 95, 275, 367, 368, 487, 533. Syn. Colossal.

Cleveland's Colossal was grown in the trial grounds at the experiment stations of Nebraska, Vermont, New York and Tennessee during the years 1889 and 1891 and was described as a late variety with large thick ears, broad grains set close on the ear.

Colossal Early, Maule's. Refs. 355, 401. Syns.

Colossal Early, Colossal Extra Early.

The name Colossal brings to mind something immense or huge. As used for this variety of sweet corn it was intended to serve as a descriptive name for an early variety producing an extra large ear. Little is known about the history of the variety except that it was introduced in 1911 by Wm. Henry Maule of Philadelphia and has continued to be one of the leading sorts offered by that concern.

Plant tall, 8 feet; tillers few, slightly shorter than central stalk. Ears borne at 5th and 6th nodes, two ears per stalk. Husked ears moderately long and plump, 8-9 x 1⅞-2⅓ inches, moderately tapering; rows 12-14, moderately straight. Kernels at milk stage white, medium size; at dry stage pale amber white, longer than wide, 1.12 x .93 x .4 cm.; triangular in shape; surface abundantly but coarsely wrinkled and creased; set loosely on cob.

Columbia. Refs. 116, 348, 565. Syns. Early Columbia, Extra Early Columbia, Upson's Columbia.

Upson's Columbia was offered in 1913 by Condon Brothers, Rockford, Illinois, as an acquisition of rare value. It was said to have been selected from Early Champion and in the Mississippi Valley it has continued to be very popular as a second early. In recent years stocks of Columbia have been offered by eastern seed houses, among them F. H. Woodruff & Sons, Caldwell & Jones, Chas. C. Hart Seed Company, and Comstock, Ferre & Company. This new Columbia, first offered in 1929, appears to be different from the earlier introduction and may have been selected from 60-day Make Good. It produces larger ears and is slightly later than its parent.

At Geneva Alneer's strain produced ears in 90 days while plants grown from the stock procured from Comstock, Ferre & Company had ears ready in 79 days. The ears were attractive, generally 12-rowed, but showing variation from 10 to 14 rows.

Columbus Market. Refs. 238, 323, 328, 329, 403, 405, 533.

This variety was introduced by A. W. Livingston's Sons, Columbus, Ohio, in 1896. The introducers at the time wrote: "Over all the multiplied varieties now offered (this variety) possesses one great advantage, and that is in its very large size for such an early sort. It comes into the market with the second earlies, such as Pee and Kay, Shakers Early, Livingston's Evergreen but is fully twice as large as any of them." The variety was not widely listed but was grown by both C. S. Clark and by the Jerome B. Rice Co. Contrary to the history of many of the varieties introduced about this time it has been continued and is today used to a considerable extent in Ohio.

Edible ears were produced at Geneva in 90 days, 2 days later than Howling Mob and 7 days earlier than Hickox. The plants grow 1-1½ feet taller than those of Howling Mob, internodes are longer and less streaked with red on the sheath. The ears are borne about the same height as on Howling Mob but are attached to much shorter shanks. The husk leaves are decidedly shorter and less prominent, and the husked ears, although

quite similar, are consistently rounded at the tip instead of conical.

Plant tall, 7-7½ feet; stalks heavy and straight; nodes 10-12, slightly exposed, not very prominent; internodes streaked with red at the base of the nodes. Brace roots present, heavy, whorl complete on one node, useful. Tillers moderately many, nearly as tall as central stalk. Leaves long, moderately broad, 33-35 x 4½-5 inches; sheath equal to and often slightly shorter than the internode. Tassels moderately long, 18-20 inches, moderately heavy and coarse, occasionally streaked with red at the base; bracts and anthers variable in color; 65-66 days to anthesis.

Ears borne at 5th and 6th nodes, one and occasionally two ears per stalk, one usually a nubbin. Shank short and heavy, 2-3 inches. Husk leaves few, very short and light. Husks many, rather heavy, medium long, rather tightly wrapped but not very difficult to remove. Silk long and abundant, variable in color. Husked ear moderately long and medium plump, 8-9 x 1½-1¾ inches, slightly tapering; base compressed, tip abruptly conical and nearly capped; rows 14-16, straight, occasionally somewhat irregular at the base.

Kernels at milk stage white, rather narrow and medium depth; at dry stage amber white, rather small, broad as long, .97 x .92 x .36 cm. (120 seeds per oz.); nearly square; crown slightly rounded; surface abundantly but very shallowly wrinkled; set slightly loose on cob.

Connecticut Beauty. Ref. 294.

The Johnson Seed Company of Philadelphia introduced Connecticut Beauty in 1913 as an early variety of extra fine quality. The ear was from 6 to 7 inches long and 12-rowed.

Cook's Special. Ref. 413.

The Vineland Station, Ontario, Canada, in 1918 considered this a very promising variety. Seed for trial was received from G. S. Peart of Burlington who secured seed from the originator, a gardener at Kingston, Ontario. It matured about the same season as Early Malcolm and produced an ear of 8 to 10 rows of deep kernels.

Cory. Refs. 16, 22, 28, 61, 67, 74, 89, 90, 91, 93, 120, 121, 123, 125, 126, 188, 207, 208, 214, 217, 238, 240, 241, 278, 298, 328, 329, 335, 338, 345, 348, 350, 367, 368, 397, 403, 405, 411, 441, 444, 478, 487, 503, 508, 509, 510, 511, 512, 514, 518, 525, 533, 535, 536, 537, 538, 546. Syns. Cory Early Sugar, Cory Sugar, Earliest of All, Earliest Rockford Market, Early Cory, Early Red Cory, Early Red Cob Cory, Early Rockford Market, Early Sweet Cory, Extra Early Cory, Extra Early Red Cory, First of All, La Crosse Early, La Crosse Sweet, Pink, Pink Cob Cory, Red Cob Cory, Red Cory, Salzer No. 48, Sweet Cory. Illus. 25.

Arising to prominence chiefly through the medium of earliness, Cory has, since its introduction in 1885, been perhaps the most widely used of all the small eared white varieties. The introduction of this variety was due solely to the great interest of James J. H. Gregory in producing new things. A review of his early catalogs cannot help but impress one with the keenness and diligence with which Mr. Gregory searched for and tried out every new vegetable which came to his attention.

Mr. Gregory gave the story of Cory in his catalog

of 1885. "Having been told by a friend (Henry C. Anthony) who marketed largely in Fall River and Providence, that the market men in his vicinity had found an earlier sweet corn of market size than the Early Marblehead, I took a journey to his vicinity (about 50 miles) to call around among his neighbors, and learn directly from their lips what they had to say about it. I saw several of them and from others who were not at home when I called I received statements after I returned. It appears that a Mr. Wm. Cory for years had a monopoly of the early market in early sweet corn; that in the course of time he gave a little to two or three of his friends, and it became known as the Cory corn."

This little cluster of marketmen who raised the Cory corn included some of the pioneer market gardeners of the country, among them being Chas. J. Talman, Wm. Lisson, John F. Chace, Chas. N. Dyer, and M. B. Sylvin. All united in testifying to the earliness of the variety, when grown in comparison with Early Marblehead. In general appearance it resembled Marblehead; and Gregory had no doubt but that the new Cory came from Marblehead. For the next 10 years this was the leading variety of sweet corn grown. It was one of those varieties with a name which seemed to have an exceedingly popular appeal and was undeniably the earliest sort that could be grown. Its decline in use came only when the desire for earliness was followed by a preference for the newer varieties with larger ears. Cory must stand out as the most popular variety developed in the period previous to 1890.

Cory required 85 days to produce edible ears at Geneva. This was 3 days earlier than White Cory, about the same season as Kendel's Early Giant, and over two weeks later than Dighton. The plants are about 1 foot shorter than those of White Cory, less consistently tillered and have slightly shorter tassels which are red at the base instead of green. The husked ears are slightly shorter and more tapering, showing an occasional 10-rowed ear instead of being uniformly 8. The variety is little grown at the present time, having been largely replaced by the strain having a white cob and larger kernel.

Plant medium tall, 4¾-5½ feet; stalks slender and straight to slightly zigzag; nodes 8-9, slightly exposed, not very prominent; internodes streaked with red on exposed surfaces. Brace roots present on one node but not complete nor very useful. Tillers few to occasionally many, nearly as tall as central stalk. Leaves medium long and medium broad, 30-32 x 3½-4 inches; sheath usually shorter than but occasionally equal to internode. Tassel medium long and slender, 16-18 inches, occasionally streaked with red at the base; terminal spike erect; lateral spikelets many, horizontal to slightly drooping, short and crowded; bracts green, sparsely striped with light red; anthers variable in color; 62-64 days to anthesis.

Ears borne at 3rd, 4th and 5th nodes, often two ears per stalk, one occasionally a nubbin. Shank variable in length, 3-8 inches. Husk leaves moderately many, long and heavy. Husks heavy, short and tightly wrapped. Husked ear moderately short and slender, 6-7 x 1¾-1½ inches, moderately tapering; base slightly expanded and open; tip long conical and slightly exposed; rows 8-10, usually regular but often paired, somewhat irregular at the base; crowded around cob; otherwise furrows deep and narrow.

Kernels at milk stage white, often pale red at the stylar attachment; wide, shallow and medium thickness; at dry stage pale reddish

brown (pecan brown); blending into a more yellow shade on the embryo side; medium size, broad and short, .9 x 1.04 x .4 cm. (120 seeds per oz.); short, broad oval in shape; crown distinctly rounded, almost semi-circular; surface sparsely and very shallowly wrinkled, almost smooth; set tightly on red cob.

Cosmopolitan. Refs. 66, 78, 241, 403, 517, 518, 533, 546. Syn. Early Cosmopolitan.

For many years early varieties with small ears of 8 to 10 rows outnumbered the varieties with larger ears. This position was gradually reversed as the years went on until there were more and more large-eared varieties on the market. Growers found it difficult to market small-eared early corn after the large ears had been taken to market. New varieties of sweet corn fairly early and with large attractive ears were quickly taken up by the growers.

Such was the case with Cosmopolitan which originated with Everett B. Clark of Connecticut and was introduced by W. Atlee Burpee in 1901. It was accepted as a worthwhile sort and offered by all major seed houses. As a measure of its popularity we would point out that it was listed by Burpee until 1923 when its place was probably taken by Burpee's Delicious. In some respects it resembled Early Champion, Metropolitan and Howling Mob. The ears were 7 to 9 inches long with 12 rows and were well filled to the tip. A weakness of the variety was the occasional rather insecure stalk which grew 5 to 6 feet high.

Country Gentleman. Refs. 74, 76, 95, 120, 121, 123, 124, 126, 207, 208, 220, 238, 240, 241, 290, 295, 328, 329, 335, 338, 344, 348, 350, 368, 403, 404, 405, 412, 445, 446, 447, 449, 474, 478, 498, 503, 508, 510, 512, 513, 514, 515, 516, 517, 518, 525, 533, 546, 549, 562. Syns. Improved Country Gentleman, "Shoe Peg." Illus. 25.

Country Gentleman, a variety name which was 14 years in the coming, was originated for the express purpose of excelling the Shoe Peg corn in size. It was introduced in 1890 by Frank C. Woodruff of S. D. Woodruff & Sons, Orange, Connecticut, and a year later by Peter Henderson & Co. of New York. The name, and the variety pattern it represented followed the succession of Quaker Sweet to Ne Plus Ultra to Shoe Peg. Each had been selected for a larger sized ear, for as Gregory said in 1893, "who that has raised that sweetest of all varieties of sugar corn which we were the first to catalog under the name of 'Quaker Sweet' has not regretted that the ear was so small as to make it difficult to market it?" The new introduction was received with such general acclaim that no improvement has been required to make Country Gentleman the best of its type.

Ninety-seven days were required to reach the mature edible stage at Geneva. This was 1 day earlier than Stowell's Evergreen, 6 days earlier than Cincinnati Market and 2 days later than The Henderson.

Plants are about the same height as those of Cincinnati Market, but lack the stockiness and short internodes of that variety. The ears are longer and more tapering, while the kernels are distinctly smaller and deeper. The majority of home garden enthusiasts recognize two late or main crop varieties — Country Gentleman

and Stowell's Evergreen. Country Gentleman has long been one of the universally well known and liked sweet-corn varieties. It is easy to understand, then, how a variety of such wide acquaintance has remained as a popular favorite these many years. Its usage is not altogether confined to the home garden, since considerable acreage is grown for the fresh market and the canning industry. The sweetness and tenderness of kernel has been appreciated by everyone who has used it.

Plant tall, 7-7½ feet; stalk moderately heavy, straight; nodes 12-14, covered, not prominent, shaded with red at the base. Brace roots present on 1st and occasionally 2nd nodes, moderately heavy, whorl complete, useful. Tillers variable in number, slightly shorter than central stalk. Leaves moderately long and medium broad, 32-34 x 3½-4 inches; sheath longer than and occasionally equal to internode. Tassels long, heavy, coarse and very bushy, 20-22 inches; terminal spike erect; lateral spikelets horizontal, very many present, multi-branched, moderately long and very crowded; bracts green, rather heavily striped with dark red; anthers uniformly dark red (van dyke to vinaceous russet); 76-77 days to anthesis.

Ears borne on the 5th and 6th nodes, often two ears per stalk; one occasionally a nubbin; shank short and moderately slender, 2-3 inches. Husks many, rather thin, moderately short, loosely wrapped and easily removed. Silk decidedly abundant, very long, uniformly dark red, not easily removed. Husked ear moderately long and plump, 8-9 x 2½-2¾ inches, decidedly tapering; base enlarged and compressed; tip long conical, slightly exposed; without regular rows, exceedingly crowded and close fitting around the cob.

Kernels at milk stage white, very long and narrow; at dry stage dull white, very long, slender, peg-like or cuneate in shape, 1.29 x .50 x .31 cm. (230 seeds per oz.); crown angular, usually irregularly dimple-dented; surface rough, deeply and coarsely wrinkled; set rather loosely on cob.

Crosby. Refs. 14, 17, 25, 61, 65, 73, 74, 89, 90, 91, 93, 95, 120, 122, 123, 197, 199, 207, 208, 214, 218, 236, 238, 240, 241, 243, 310, 328, 329, 367, 368, 397, 403, 404, 406, 407, 408, 410, 414, 422, 430, 442, 444, 456, 487, 503, 507, 508, 533, 535, 536, 545. Syns. "Boston Market," Crosby Dwarf Sugar, Crosby Early Dwarf, Crosby's Early Sugar, Crosby Early 12-Row, Des Moines, Early Crosby, Early Des Moines, Extra Early Crosby, Fottler's Early, Harris Sweet, Maine Crosby, Market Gardener, Medium Crosby, Original Crosby, True Crosby. Illus. 25, 30.

This sweet corn is one of the oldest of all varieties. It bears the name of Josiah Crosby who was also the originator of the Crosby Beet. Josiah Crosby, who was born in 1805, did not become a farmer on his own land until the year 1847 when he moved to Arlington, Massachusetts, and began an experience of 40 years as a market gardener, in which he had no superiors and few equals. A memorial resolution published in the 1887 *Transactions* of the Massachusetts Horticultural Society says, "he earnestly strove to attain excellence and in the effort to improve the quality of market vegetables, he originated the excellent variety of sweet corn which was named for him."

Sturtevant claims that Crosby was introduced in 1860 which seems probable since it was listed by Thorburn in 1871, Breck in 1870, Vick, 1870, and by Gregory in 1867. Its origin is quite unknown since it differs from any of the types then known. In the deep kernel

pattern, however, it does bear resemblance to some of the evergreen varieties.

Many writers consider it unsurpassed in quality; certainly its use gained for the Maine sweet corn canners a reputation for unusual quality and excellence. Gregory in 1869 says, "Most every early variety of sweet corn is too small for market, this is 12 and sometimes 14 rowed, of good market size, and very sweet. Crosby's Early is the standard in Boston Market." Crosby itself was sometimes known as Boston Market, being so listed in 1868 by Curtis and Cobb and in 1871 by H. E. Acker. There are many existing strains of this well known variety but the original qualities which made it so individual remain in present day stocks.

At Geneva 87 days were required for this variety to produce edible ears. This proved to be 1 or 2 days later than Minnesota Crosby, in season with Alameda and Howling Mob, and 3 days earlier than Quincy Market. The plants are considerably more slender and 1-1½ feet shorter than those of Howling Mob; likewise the tassel, altho of equal length, is much more slender and feathery than that of Howling Mob. The husked ears differ from other varieties in possessing very small, more uniformly sized and shaped kernels, straighter rows and more abruptly rounded, more uniformly and well filled tips. The compactness of the kernels and rows is only approached by some near relative of Crosby such as Quincy Market. Crosby has been widely accepted and grown for the canning industry particularly in the northeastern part of the United States. In the New England states it is the leading variety for this purpose, and has done much to create the favorable reputation that Maine grown canned sweet corn enjoys.

Plant moderately tall, 5¾-6½ feet; stalks slender, slightly zigzag; nodes 10-12, moderately exposed, somewhat prominent; internodes streaked with red on exposed portions, especially at the base of the nodes. Brace roots present, rather slender, not very useful. Tillers many, much shorter than central stalk. Leaves moderately short and moderately narrow, 26-28 x 3-3½ inches; sheath shorter than internode. Tassel long and heavy, 20-22 inches, rather feathery; terminal spike erect; lateral spikelets drooping, many, long, multi-branched and moderately crowded; bracts green, moderately striped with red; anthers variable in color; 63-64 days to anthesis.

Ears borne at 3rd and 4th nodes, one and occasionally two ears per stalk, one often a nubbin. Shank moderately long, 5-8 inches, slender but somewhat tough. Husk leaves many, long and heavy. Husks moderately many, medium long, rather loosely wrapped, easily removed. Husked ear medium long and moderately plump, 7-8 x 1¾-2 inches, nearly cylindrical, slightly tapered; base enlarged and compressed; tip abruptly conical; rows 12-16, regular, straight, crowded around cob.

Kernels at milk stage white, very small, narrow, rather thick and deep; at dry stage opalescent white, moderately long and narrow, .94 x .70 x .40 cm. (188 seeds per oz.), long triangular in shape; crown nearly square; surface very finely, abundantly but shallowly wrinkled; set nearly tight on white cob.

A strain of Crosby known as Minnesota Crosby is used in some sections as a canning variety. It is not listed by the regular seedsmen inasmuch that its use as a canning variety has limited it to growers with that market.

Crosby Minnesota came into production about the same time as regular Crosby. The plants are slightly taller than those of Crosby and possess ears that are longer and more tapering, lacking the abruptly conical to rounded tip characteristic of Crosby.

Cupid. Refs. 263, 298, 345. Syns. New Cupid, Sugar Sweet.

"There is an old saw, often quoted to the effect that 'good things come in small packages.'" This was the foreword by which Peter Henderson & Co. of New York introduced New Cupid in 1923. A few ears of a surprisingly sweet corn were obtained in 1918 from M. A. Albertson of Nutley, New Jersey. They were very small ears, about 2½ inches in length, but were very sweet. The ears were so small that there was scarcely a mouthful on them, but by selection the size was increased and the sweetness and tenderness retained. Henderson changed the name Cupid to Sugarsweet in 1922 and again stressed its value as a corn for the roadside stand or the sweet corn for the connoisseur.

Cupid or Sugar Sweet produced edible ears at Geneva in 80 days, 5 days later than Early June, in season with Whipple's Early and 4 days earlier than Early Pearl. The plants are 1-1½ feet taller than those of Early June with a decidedly greater tendency to tiller and with tassels having both terminal and lateral spikelets longer and more drooping. The husked ears are of equal length but those of Cupid are somewhat more plump, contain 2-4 more rows of kernels and are decidedly more abruptly conical to rounded at the tip. The edible product has been found to be very tender and sweet. As a home garden sort for those who desire variety, Cupid is worthy of trial.

Plant moderately short, 4½-5 feet; stalk slender, straight; nodes 7-9, covered, not prominent; internodes show exposed portions streaked with light red. Tillers many present, slightly shorter than central stalk, often terminate in a pistillate inflorescence, occasionally bearing a small ear. Leaves moderately short and moderately narrow, 25-28 x 3-3½ inches; sheath longer than internode. Tassel moderately short and slender, 14-16 inches; terminal spike erect, lateral spikelets slightly drooping, moderately many, short and somewhat crowded; bracts green, rather heavily striped with dark red; anthers golden yellow (deep colonial buff to chamois); 58-62 days to anthesis.

Ears borne at 3rd and 4th nodes, often two ears per stalk with additional nubbins occasionally present. Shank short, 2-3 inches, slender and moderately brittle. Husks moderately few, rather light, loosely wrapped and easily removed. Silk moderately abundant, decidedly long and uniformly red in color. Husked ear moderately short and slender, 5-7 x 1¼-1½ inches; nearly cylindrical, very slightly tapering; base rounded; tips decidedly rounded and usually capped; rows 10-12, straight, slightly irregular at base, crowded around cob.

Kernels at milk stage white, moderately small, medium wide, shallow and quite uniform; at dry stage opalescent white, small, narrow, short and thin, .9 x .8 x .38 cm. (152 seeds per oz.); usually short triangular in shape; crown slightly rounded; surface often abundantly and finely wrinkled; set tightly on cob.

Darling's Early. Refs. 45, 87, 89, 91, 255, 268, 269, 343, 397, 410, 411, 412, 422, 428, 507, 508, 524, 533, 537, 539. Syns. Darling, Darling's Sugar, Sugar Productive.

"Darling's" is possibly the first proper name to be associated with a variety of sweet corn. The

list of varieties existing at the time of its introduction was confined to Papoon, Eight-rowed Early, Dwarf Early and Sweet or Sugar. Noyes Darling wrote the story of its origination to the Albany Cultivator from New Haven, Connecticut, Nov. 18, 1844. This was published in the Annual Report of the U. S. D. A. of 1845, page 446. The story of the steps taken to produce a new variety is most illuminating: The original crossing, the segregation of the promising recombinations and the selection and trial of the most promising line until such time as it resulted in a pure or unmixed stock.

The original cross must have been made about 1836. Seed of a very early yellow corn was planted in a patch of sweet or shrivelled corn "then considerably grown." The tops or blossoms of the yellow corn were cut off in order that the early corn might be impregnated only by the sweet corn. The result the first year was yellow corn of the usual size and appearance, although a mixture of yellow and white smooth corn and sweet or shrivelled corn occurred on some cobs. The third year planting (from smooth and shrivelled seed planted separately) produced ears for the most part that corresponded with the kernels planted. There was a slight mixing of the shrivelled on the smooth and of the smooth on the shrivelled.

The next year the two kinds were again planted separately and the smooth corn produced its like as did the shrivelled. The latter had the disadvantage of being yellow, but was earlier than common sweet corn and equally palatable. Was this the precursor of Golden Nugget and Golden Bantam? Its value was not appreciated and it was accordingly dropped from further consideration. The fifth year white and yellow smooth corns were planted separately and the earliness of the separate plants carefully watched. The sixth year, the early and late were planted separately and upon a few ears of the earliest variety a few scattering kernels of a white sweet corn were noticed. These were carefully picked out and planted by themselves. The result was a white sweet corn fit for boiling July 18.

Mr. Darling closed his remarks with, "My object in instituting this experiment having been to obtain a corn suitable in color and early maturity for marketing, I discarded the yellow varieties closing the experiment in possession of an eight-rowed sweet corn with ears 6 to 7 inches long and fit for boiling 18th July (in 1844, 14th)." This corn became Darling's Early listed by Hovey & Co. in 1859 and others. It was one of the varieties described by Burr in 1863 and was one of four varieties named by Henderson in 1867. It was listed until the last decade of the century when a number of varieties of similar type were introduced differing only slightly from the original Darling's Early.

The brief description included in this account is a compilation of data from several sources, and will serve to indicate the type which was subsequently selected by seedsmen.

Plant moderately tall, 5½-7 feet; stalks slender. Tassel slender with laterals decidedly drooping. Ears borne 22-28 inches from the ground, possess few short husk leaves. Dried ear medium

long, 6-8 x 1⅜-1½ inches, nearly cylindrical, frequently somewhat curved; rows 8, regular, pairs distinct. Kernels at dry stage whitish amber, broader than long, 107 seeds per oz.; crown distinctly rounded, surface rather abundantly wrinkled; set tightly in the row.

Delicious. Refs. 38, 267, 358, 502, 519.

Delicious as the name of a variety of sweet corn has been used by three different seed companies. The first to appear was Michell's Delicious introduced in 1899 by Henry F. Michell Co. of Philadelphia. This was a second early which had been selected by an old Philadelphia gardener and carefully selected for well filled ears and pearly whiteness of kernel. The variety has been perpetuated by Michell and is still listed among the medium sugar corns.

The Holmes Seed Company of Harrisburg, Pennsylvania, named and introduced Holmes' Delicious in 1907. This came from Wm. K. Harris, a Philadelphia florist and gardener who believed it to be the most delicious corn ever. This variety, as Holmes' Delicious, was also listed in 1911 by Gregory. When the Holmes Seed & Nursery Co. was discontinued in 1923, the strain was lost but has since been reoffered by the Holmes Seed Co. of Canton, Ohio.

Delicious, Burpee. Refs. 83, 348, 534. Syn. Early White.

The most recent introduction of a sweet corn by this name was by the W. Atlee Burpee Co. of Philadelphia in 1924.

This had originated with Dr. Herbert Hoffman of Merchantville, New Jersey, who at the same time had begun the selection work which resulted in its companion variety, Sunnybrook. Both came from a single ear of Bantam type bearing yellow and white kernels found in a planting of Golden Bantam. Eight years of selection followed, and "this was ready to introduce as a white sort, similar to Golden Bantam in quality," although much later in season and with larger ear.

Ninety-four days were required for edible ears to be produced at Geneva. This was 3 days earlier than Hickox, in season with Nector and 6 days later than Howling Mob. The plants are about one foot shorter than those of Hickox, having shorter internodes and a greater tendency to tiller. The husked ears are much alike, although Delicious will often have more rows. In the dry stage the kernels of Delicious appear whiter and less amber colored, and are slightly broader. This variety is grown chiefly for the market and home garden, although it appears to have as much in its favor from the standpoint of appearance, vigor and number of ears per plant as Hickox, a variety used widely for canning.

Plant moderately tall, 6-7 feet; stalks moderately heavy and straight; nodes 12-13, covered, not prominent. Brace roots present, moderately heavy, whorl complete and useful on one node. Tillers many, slightly shorter than central stalk. Leaves moderately long and medium broad, 30-32 x 3½-4 inches; sheath longer than internode. Tassel moderately long and moderately slender, 18-20 inches; terminal spike erect; lateral spikelets horizontal to slightly drooping, moderately many, medium long, rather crowded and multi-branched; bracts green, sparsely striped with pale red;



CROSBY

(Three-quarters natural size)



EARLY MARKET

(Natural size)

anthers reddish bronze (terra cotta to vinaceous russet); 68-70 days to anthesis.

Ears borne at 5th, 6th and 7th nodes, usually two ears per stalk with an additional nubbin occasionally present. Shank moderately long, 5-6 inches, medium heavy. Husk leaves moderately few, short and light. Husks moderately many, long and tightly wrapped, rather difficult to remove. Silk abundant, long and easily removed. Husked ears moderately long and moderately plump, 8-9 x 1½-2 inches; slightly tapering; base moderately compressed to slightly open; tip conical, slightly exposed and occasionally capped; rows 12-14, straight, occasionally curved, crowded around the cob.

Kernels at milk stage white, medium size, distinctly thick; at dry stage opalescent white, slightly longer than wide, 1.1 x .95 x .42 cm. (100 seeds per oz.); triangular in shape; crown rounded; surface abundantly and rather deeply wrinkled; set loosely on cob.

Dighton. Refs. 185, 300, 335, 345, 348, 478, 485, 563.

Syns. Early Buffalo, Early Dighton, "Early Wonder-Woodruff," Extra Early Dighton, Portuguese, Wayahead. Illus. 25.

This very early white variety was a selection from either Extra Early Dawn or Red Cob Cory and was introduced in 1922 by S. D. Woodruff & Sons, Orange, Connecticut. The selection was named for the town of Dighton, Massachusetts, where it was first used. For several years following its introduction it was the earliest corn appearing on the Boston Market, but had little except earliness to commend it. The name Portuguese was sometimes used in connection with the variety but this apparently has little significance.

Edible maturity was obtained at Geneva in 69 days, and proved to be, with the exception of Pickaninny, which came in 67 days, the earliest of all sweet corn varieties. This was 6 days earlier than Alpha and 16 days earlier than Red Cory. The plants have a decidedly greater tendency to tiller and a tassel that is considerably more heavily marked with red. The ears are of similar size and shape with furrows more prominent and kernels in the dry state more uniform and deeper reddish brown in color. Its chief attribute is earliness, and as such is used to a considerable extent by home gardeners.

Plant short, 3¾-4¼ feet; stalk slender, slightly zigzag; nodes 7-8, exposed, prominent; exposed portions of internodes slightly streaked with light red. Brace roots usually not present; tillers usually numerous, somewhat shorter than central stalk. Leaves short and moderately narrow, 20-25 x 3-3½ inches; sheath shorter than internode. Tassel short and slender, 14-15 inches; base heavily streaked to solid dark red; terminal spike erect; lateral spikelets nearly erect, few, simple, decidedly short and scattered; bracts green, quite heavily striped with dark red, occasionally ringed with red at the base; anthers bronze red (terra cotta to vinaceous russet); 55-57 days to anthesis.

Ears borne at 3rd and 4th nodes, one and two ears per stalk with one usually a nubbin. Shank medium long, 3-5 inches, slender, brittle. Husks few, thick, easily removed, short, rather tightly wrapped. Husk leaves few and short. Husked ear medium long and moderately slender, 6-8 x 1½-1⅞ inches; moderately to decidedly tapering; base somewhat expanded and open; tip conical and exposed; rows 8-10, noticeably paired, straight, not crowded around cob; furrows moderately deep and occasionally rather wide.

Kernels at milk stage creamy white, moderately narrow, thin and shallow, not very uniform; at dry stage deep brownish red (hay's russet), with the base much lighter in color; medium size, short and medium wide, .92 x 1.18 x .40 cm. (96 seeds per oz.); short, broad oval in shape; crown rounded; surface coarsely and shallowly wrinkled; set tight on red cob.

Dolly Dutton. Refs. 22, 87, 89, 91, 340, 397, 411, 426, 427, 507, 508, 535, 536, 537. Syns. Early Dutton, Dutton.

The group of early varieties to which Dolly Dutton belonged was characterized by the smallness of the plant and ear, as well as by earliness of season. Introduced about 1878, it was described by Sturtevant in 1884 and offered by most seed houses of the period as an extra early. One grower reported that he was highly pleased with it as a variety for the amateur gardener, but that it was entirely unsuited for a market corn.

Plant short, 3-4 feet; stalks slender. Ears borne low, shank short and slender. Dry ear short and slender, 4-6 x 1½-1⅝ inches; nearly cylindrical to slightly tapering; rows 8, straight, regular, usually somewhat paired at the base, showing rather wide furrows. Cob often tinged with red in the center. Kernels at dry stage whitish amber, wider than long; (121 seeds per oz.); crown distinctly rounded; surface rather heavily wrinkled.

Double-Barrelled Best. Ref. 499. Syn. Best Double-Barrelled.

Arthur L. Richie of Riverton, New Jersey, was the originator of this sweet corn which was introduced in 1913 by Walter P. Stokes of Philadelphia. Mr. Richie, who was one of the leading sweet corn growers of Burlington County, had been a student at Cornell University and was much interested in plant breeding and variety improvement work. In 1906 on one field which was planted half to Stowell's Evergreen and half to a variety known locally as "Government Corn," he began the work which led to a new corn which was called Best Double-Barrelled. This name had been a slang expression of a farmer for whom Mr. Richie had once worked, and was used because of the large number of plants with two ears.

The two parent varieties differed in size and thickness of ear but both were of the same maturity. The first season, 1906, just before cutting for market a large number of plants having two ears were topped, and saved for seed. Since sugar corn was always sold in the husk, Mr. Richie paid more attention to the exterior appearance of the ear. The field selections, however, were carefully culled at husking time. After seven years' work of selection toward uniformity of ear and two-eared stalks the variety was taken up by Mr. Stokes who reversed the name and introduced it as Double-Barrelled Best. During the decade following it became one of the most popular corns on the Philadelphia market. After 1926 it was not offered, the place it once occupied being taken by Sunnyslope Special.

Durkee. Refs. 22, 90, 91, 274, 367, 368, 508, 509, 510. Syn. Durkee Sweet.

Introduced by James J. H. Gregory in 1889, this variety was originated by Thomas C. Durkee of West Peabody, Massachusetts. It was a selection from Crosby and had considerable local demand since it was like the parent in quality but a few days later in season. After 1893 it was dropped from listings as it differed but little from Crosby.

Dwarf Early. Refs. 14, 22, 59, 74, 90, 91, 308, 414, 422, 428, 439, 503, 507, 508. Syns. Early Dwarf Sugar, Early Sweet Dwarf, Extra Early Dwarf, Extra Early Dwarf Sugar.

This was one of the names applied to the early dwarf corn that came originally from an Indian source. It might even have been the early Papoon corn or a selection from it. Salisbury in 1848 named a small Early Sweet which was sometimes called Eight-rowed Early. Descriptions of these varieties as well as of Tom Thumb and Boynton show the type to be small eared and early. To a grower who criticised its size the editor of the *Rural New Yorker* in 1884 replied, "But we shall probably never find the earliest varieties with the large ears."

Plant short, $3\frac{1}{2}$ -4 feet, stalks slender; ears borne close to the ground; husked ear short and slender, $5-7 \times 1\frac{1}{2}-1\frac{3}{8}$ inches, cylindrical or nearly so, more or less curved; rows 8, somewhat curved, regular. Kernels at milk stage white, small, shallow; at dry stage amber white, slightly wider than long (108 seeds per oz.), ovate in shape; crown rounded; surface wrinkled; set tightly on white cob.

Since the name Dwarf Early, and the type it represents is one of the very oldest among all the sweet corns, it is not out of the ordinary to find so many different name variations which have been associated with it. It is impossible to reconstruct the type as originally used or the selection from this type as offered in the earlier catalogs. A few of these old names have been given as synonyms of Dwarf Early. Naturally there are others about which we have been unable to collect much information. The following names were used previous to 1890, for slightly varying forms of Dwarf Early: Bates's Extra Early, Brill's Early Dwarf Sugar, Early White, Extra Early Sugar, Improved Extra Early White, Sweet or Sugar, and Sweet Sugar.

Earliest. Refs. 34, 117, 345, 346, 348.

This name might be associated with many early corns or given to strain selections of any one of several promising sorts. Beckert's Seed Store, Pittsburgh, Pennsylvania, offered Beckert's Earliest in 1923 and in 1932 Beckert's Earliest Improved. These have been in trials at Geneva and produced ears very similar to other early white corns such as Alpha, Early Denver or Early Fortune. The strain first introduced was described as with ears 6 to 7 inches long with 8 to 10 rows of broad white kernels on a pinkish cob. Earliest Improved as grown at Geneva had ears with white cob and 10 to 12 rows of kernels.

Early Aviator. Ref. 44.

F. W. Bolgiano & Co. of Washington, D. C., sponsored this in 1928. In trials at Geneva it appeared to be a rather short eared early variety. It was last listed in the catalog of 1931, and as far as it is known has not been cataloged by any other company.

Seventy-six days were required for this variety to produce edible ears at Geneva. This was 1 day later than Alpha, 6 days later than Early Market, and 4 days earlier than Whipple's Early. The plants are slightly taller than Early Market with tassel slightly longer, more slender and feathery. The ears are much

the same as Early Market with tips not as rounded and dry kernels showing more white and less amber. Because of its similarity to the popular and meritorious variety Early Market, it was not grown to any great extent.

Early Boynton Sweet. Refs. 22, 90, 91, 137, 168, 422, 430, 508, 535. Syns. Boynton, Boynton Early.

This early dwarf corn was first listed by D. M. Ferry & Co. in 1877. It was apparently developed by a Mr. Boynton who had grown the variety one or two years previous to 1877. It was a white cob sweet corn, short stalks without tillers; ears 8-rowed, small and rather pointed. Early Boynton was similar to Dwarf Early Sugar, Dolly Dutton, Tom Thumb and Early Minnesota, and was probably selected from one of those or from the precursor of the group.

Early Dakota. Refs. 335, 345, 554, 558. Syns. Dakota, Early Improved Dakota.

Early Dakota was a selection from Mammoth White Cory and as such was offered by Oscar H. Will & Co. until about 1920. At that time a new stock which had proved to be an even more adequately adapted early white sweet corn was used. This new corn came from a rancher in Wyoming and had been called "Diamond S" after the name of the ranch. It had been grown there for some 15 years. Early Dakota corn has been one of the most successful varieties listed by Will since 1894 and is one of four leading white varieties recommended for North Dakota today.

Eighty-two days were required for Early Dakota to produce ears at Geneva. This was 2 days later than Mammoth White Cory and in season with Early Fordhook. The plants are $1\frac{1}{2}$ -2 feet taller than those of Mammoth White Cory, heavier and distinctly more zigzag. The husked ears are about the same length but somewhat more plump and average two more rows of slightly narrower kernels.

Plant medium tall, $5\frac{1}{2}$ -6 feet; stalks medium thickness and zigzag; nodes 8-9, exposed and prominent. Brace roots present, slender, whorl nearly complete on one node and useful. Tillers few to none, much shorter than central stalk. Tassel medium long and rather coarse, 16-18 inches; terminal spike erect; lateral spikelets horizontal, medium long, many present and moderately crowded; bracts and anthers variable.

Ears borne at 4th and 5th nodes, one and occasionally two per stalk; medium long and moderately plump, $7-8 \times 1\frac{3}{4}-2$ inches, distinctly tapering; base somewhat enlarged and compressed; tip conical and exposed, rows 12-14, nearly straight, slightly irregular and spiral.

Kernels at milk stage white, medium size; at dry stage dull amber white, slightly longer than wide, medium thickness, $1.1 \times .98 \times .4$ cm. (88 seeds per oz.); crown slightly rounded; surface abundantly and rather deeply wrinkled, often creased longitudinally; set somewhat loosely on cob.

Early Dawn. Refs. 207, 208, 285, 345, 444. Syn. Dawn.

The first variety to bear this name was that listed in 1892 by Johnson & Stokes, Philadelphia. They offered Early Dawn as the "largest eared white cobbled early sweet corn." The originator from whence the stock seed came was a gardener in northern Vermont.

A variety which would ripen seed in that northern latitude was of necessity early. By some it was believed to have been a selection for earliness from Stowell's Evergreen. The ears were large, often containing from 16 to 24 rows, kernels large, plump, and with a minimum of shell or hull. In earliness it compared favorably with Early Crosby. After 1901 this strain disappeared.

A sweet corn with the same name, Early Dawn, was offered in 1907 by S. M. Isbell & Co., Jackson, Michigan. This, however, was an 8-rowed sort with dwarf plant and ear with large wide kernels. Later this stock appeared as a 12-rowed variety and now closely resembles Early Market.

Early Dean. Refs. 22, 367, 368, 440, 441.

Other than its mention in the *Rural New-Yorker* of 1888 and 1889, little is known of this variety. Seed for planting in the trial grounds of the *Rural New-Yorker* had been secured from T. H. Hoskins of Newport, Vermont. In season it was very close to Cory and Marblehead but with taller plants, larger ears and much better quality.

Early Denver. Ref. 551.

The Western Seed Company, Denver, Colorado, first offered this corn in 1929. A Mr. Fred Bunger was given credit for originating this early sort. The plant was rather dwarf in habit, ears 6 to 7 inches long with 10 to 12 rows. Somewhat like Early Market.

Early Dow. Ref. 321. Syn. Dow's Extra Early.

This, one of the earliest white sweet corns in our trials, was named for George Dow, a Minnesota gardener. After many years of selection from Extra Early Cory, a small quantity of seed was secured by C. J. Lindholm, Minneapolis, Minnesota, who introduced it in 1920. The original Cory was popular because of its earliness but after some years there were many Cory stocks that had lost this character. Perhaps Dow was successful in finding a strain which was more like the original.

Seventy-two days were required for this variety to reach edible maturity; 2 days later than Aroostock Early, 3 days earlier than Alpha and 16 days earlier than White Cory. The plants are 1-1½ feet shorter than those of White Cory, are less inclined to tiller and have tassels that are decidedly shorter and possessing fewer laterals. The husks extend much less over the tip and are more loosely wrapped. The husked ears are 1-1½ inches shorter and have kernels that are broader for the depth than those of White Cory. Its utility lies in the fact that it is early. Some seasons it will come into production as early or earlier than any other variety, but the average season is as designated above.

Plant short, 4-4½ feet; stalks slender and zigzag; nodes 7-8, exposed and prominent, usually streaked with red at the base. Brace roots usually absent. Tillers few, slightly shorter than central stalk. Leaves short and moderately narrow, 20-25 x 3-3½ inches; sheath shorter than internode. Tassels moderately short and slender, 15-16 inches; terminal spike erect; lateral spikelets horizontal, medium long, simple, medium in number and not

crowded; bracts variable in striping; anthers usually buff (deep colonial buff to chamois); 54-56 days to anthesis.

Ears borne at 3rd and 4th nodes, one and two ears per stalk with one usually a nubbin. Shank medium long and slender, 4-5 inches. Husk leaves few, short and light. Husks few, short and rather loosely wrapped. Silk scanty, short and variable in color. Husked ear moderately short and slender, 5½-6½ x 1¾-1½ inches, moderately tapering; base enlarged and rather open; tip conical and exposed; rows 8, usually paired, moderately straight, somewhat irregular at the base; furrows deep and wide at the base but more narrow near the medial and tip.

Kernels at milk stage white, medium size, shallow; at dry stage dull amber white, broad as long, 1.0 x 1.1 x .38 cm. (96 seeds per oz.); short, oval in shape; crown rounded, often semicircular; surface coarsely and shallowly wrinkled; set moderately tight on cob.

Early Essex. Refs. 222, 238, 241, 405, 567. Syns.

Essex Sweet Early, New Early Essex.

This variety, for a limited time, was quite popular with market gardeners of eastern Massachusetts. No record of the originator is available but it probably came from the town of Essex, Massachusetts, and it is possible that Aaron Low, a seedsman of that town, first developed it. It was first listed by S. D. Woodruff & Sons of Orange, Connecticut. James J. H. Gregory & Son of Marblehead, offered it as a novelty in 1903. In season it was as early as Quincy Market but with a larger and more coarse appearing ear. After a few years its place was taken by better varieties.

Early Evergreen. Refs. 4, 40, 144, 238, 241, 329, 403, 469, 515, 516, 517, 518, 562. Syns. Extra Early Evergreen, New Early Evergreen, Select Early Evergreen. Illus. 25.

The name Early Evergreen rather than standing for a fixed type is used for a number of strains often differing to a marked degree. As far as is known all of the various Early Evergreens were the result of selection for earliness from Stowell's Evergreen. At the time the first sweet corn bearing this name was introduced by Moore & Simon of Philadelphia, in 1896 there were other selections in existence which had not been formerly introduced.

Ferry's Early Evergreen was introduced by D. M. Ferry in 1898. Other strains which have become well established are Dobbin's Early Evergreen, Clark's Early Evergreen, Earle's Early Evergreen, Rice's Early Evergreen and Perry's New Early Evergreen.

The name "Evergreen" has undoubtedly maintained many pleasant associations among the consumers of sweet corn. It is natural to expect, then, that an earlier type of the well known Stowell's would find a place in the home and market garden. It is also used to some extent by the canning trade, although as with most white varieties, the demand for canned white corn is decreasing.

At Geneva, edible ears were obtained in 92 days, 6 days earlier than Stowell's Evergreen and 4 days later than Howling Mob. Plants are slightly taller than Stowell's Evergreen, with fewer tillers present but otherwise very much alike. The ears are borne on much shorter shanks than those of Stowell's Evergreen, while the husked ears are slightly shorter and more cylindrical. The kernels on the dry ear are straight

across the crown instead of converging, often more regularly arranged in rows and less coarsely wrinkled and creased.

There is undoubtedly more variation in strains of Early Evergreen than between strains of any other variety in common usage. Ferry's Early Evergreen produces a shorter, less vigorous plant that quite consistently produces distinctly whitish green tassels that bear very bright yellow anthers. It, however, produces a short Stowell's Evergreen ear type with its characteristic converging crown to the dry kernels with coarse, deep wrinkling and creasing. Earle's Early Evergreen is probably the most widely divergent of the types sold under this name. The ears are 7 to 9 inches long, possess 12 rows of kernels that are decidedly shorter than any other strain. Moreover, it produced edible ears in 88 days at Geneva, which was 4 days earlier than the type described. The type represented by C. S. Clark's Early Evergreen which is regarded as typical by the majority of seedsmen, is described below.

Plant tall, 8-8½ feet; stalks heavy and straight; nodes 12-14, slightly exposed, not very prominent. Brace roots present, heavy, whorl complete on one node, useful. Tillers few, slightly shorter than central stalk. Leaves long and medium broad, 34-36 x 3½-4 inches; sheath slightly shorter than internode. Tassel moderately long, 18-20 inches, heavy and coarse; terminal spike erect; lateral spikelets horizontal to slightly drooping, medium long, many, crowded; bracts green, very slight to no red stripe present; anthers buff (deep colonial buff to chamois); 62-64 days to anthesis.

Ears borne at 5th and 6th nodes, one ear per stalk in addition to one nubbin present. Shank short and heavy, 2-3 inches. Husks moderately many, heavy, rather short and tightly wrapped, somewhat difficult to remove. Silk moderately abundant, long and red. Husked ear medium long and plump, 7-8 x 2-2¼ inches, somewhat cylindrical to slightly tapering; base slightly enlarged and compressed; tip abruptly conical and slightly exposed; rows 16-18, straight, slightly irregular at the base, crowded around the cob.

Kernels at milk stage white, moderately large, medium width, deep; at dry stage opalescent white, decidedly longer than broad, rather thin, 1.3 x .78 x .33 cm. (112 seeds per oz.), rectangular; crown nearly straight across; surface very deeply creased and wrinkled; set loosely on cob.

Early Fordhook. Refs. 74, 77, 97, 238, 240, 298, 328, 329, 335, 345, 348, 382, 403, 404, 405, 453, 454, 503, 513, 514, 546. Syns. Firstin, Fordhook.

Introduced by W. Atlee Burpee Co. of Philadelphia, this variety has been continued in present day catalogs of that company as the "earliest large white sweet corn." No information concerning its history, other than that it came from a grower in Connecticut, is available. When introduced it was one of many new varieties that were put forth as superior to Cory in one or more characters. Early Fordhook was advertised as earlier than Cory with a longer ear and deeper kernel.

At Geneva Fordhook required 82 days to reach edible maturity. This was 3 days earlier than Ford's Early, in season with Adam's Early and 2 days later than Whipple's Early. Plants most resemble those of Ford's Early, being more slender and zigzag with tillers considerably shorter in proportion to the central stalk. The ear shanks are longer with husks shorter and more

tightly wrapped. The husked ears are slightly shorter, more variable in the number of rows and contain kernels which, on the 8 rowed specimens at least, are noticeably broader.

Plant medium tall, 5¾-6 feet; stalk moderately slender and slightly zigzag; nodes 8-9, exposed, somewhat prominent; exposed portions of internodes streaked with red. Brace roots occasionally present, not very useful. Tillers few, much shorter than central stalk. Leaves medium long and moderately narrow, 28-30 x 3¼-3½ inches; sheath shorter than internode. Tassel moderately long and slender, 18-20 inches; streaked with red at the base; terminal spike slightly drooping; lateral spikelets slightly drooping, moderately many, moderately long, and somewhat crowded; bracts and anthers quite variable in color; 58-60 days to anthesis.

Ears borne at 3rd and 4th nodes, one and occasionally two ears per stalk, one usually a nubbin. Shank variable but usually 6-9 inches long, tough. Husks rather short, tightly wrapped, heavy, not easily removed. Husked ear medium long and moderately slender, 7-8 x 1½-1⅝ inches, moderately tapering; base slightly expanded and open; tip long, conical, and slightly exposed; rows 8-10, very often paired, moderately straight; furrows on 8-row ears deep and wide at the base, not crowded around the cob.

Kernels at milk stage white, large, broad and shallow; at dry stage dull white, very broad and medium long, 1.1 x 1.25 x .41 cm. (80 seeds per oz.); broad, short oval in shape; crown rounded; surface abundantly but rather shallowly wrinkled, often coarse; set tightly on cob.

Early Fortune. Refs. 41, 299. Syns. Early Harvester, Extra Early Fortune, Extra Early Harvester.

This sweet corn was grown in trials at Geneva for several years, and as an early 8-rowed variety proved to be quite similar to Aroostock Early. Early Fortune has been listed since 1918 by the J. W. Jung Seed Co. of Randolph, Wisconsin, who accredit its origin to a Canadian source. These varieties represent a type which might well have been that of the original Malakoff but the instability of present stalks make the comparison impossible.

Early Hampshire. Ref. 55.

Joseph Breck & Sons, Boston, secured this from a New Hampshire farmer who had selected it for earliness from Quincy Market. The variety therefore is similar to certain stocks of Crosby but a comparison of ears from these 3 varieties showed those of Early Hampshire to be larger. Breck first listed the variety in 1915 and for many years a considerable quantity of seed was sold to New England growers. White varieties today have very definitely lost their favored position in the Boston district and whereas in 1915 Breck listed 13 white varieties to 1 yellow, in 1933 the ratio was changed to 6 white and 8 yellow. This may account for the dropping of many very excellent white varieties, among them Early Hampshire, which was last offered in 1927.

Early Iowa. Refs. 133, 541.

Vaughan's Seed Store offered Early Iowa in 1909 as the earliest real sweet corn of marketable size. The originator, W. B. Perry of Cresco, Iowa, claimed to have crossed Perry's Hybrid and Salzer's Northern Pedigree nearly 50 years ago. The stock was kept in his possession until discovered by Vaughan. Pictures show that it was an 8-rowed ear, about as large as Cory. In earliness it was within 2 days of Malakhoff and a week earlier than Cory. Vaughan carried this variety until 1924.

Early June. Refs. 234, 242, 334, 335, 345, 413, 555.

Syn. Early July.

For the Northwest and the northern Great Plains area this is reputedly the earliest known variety. Early June was first secured by Oscar H. Will from Robert Holmes of Anoka, Minnesota. It had been selected on the basis of earliness for 6 or 7 years using Peep O'Day for comparison. The trials in North Dakota justified the claim to earliness and it was introduced in 1900. This was the same year that Peep O'Day was introduced, and it is possible that these two varieties had a common origin, possibly White Cob Cory, although they are both earlier and smaller eared.

At Geneva this variety produced edible ears in 75 days, in season with Alpha, 3 days later than Early Dow, and 3 days earlier than Honey Dew. The plants are slightly shorter than those of Alpha, inclined to tiller more but otherwise are very much alike. The greatest difference exists in the ears which are slightly more slender, consistently shorter, more cylindrical and more completely capped at the apex. It was developed to more adequately suit the short growing season in the northern plains area where its earliness meant much to the home gardener. In other sections it has little significance because of its small size.

Plant short, 3-3½ feet; stalk moderately straight and slender; nodes 6-8, not prominent. Brace roots absent. Tillers few, equal in height to central stalk. Leaves short and narrow, 22-24 x 2½-3 inches; sheath equal to and very often shorter than internode. Tassel short and very slender, 12-15 inches; terminal spike erect; lateral spikelets nearly erect, few, short and moderately crowded; bracts dark green, quite heavily striped with red; anthers buff colored (deep colonial buff to chamois); 55-58 days to anthesis.

Ears borne at 2nd and 3rd nodes, one ear per stalk with an additional nubbin usually present. Shank moderately short, 2-3 inches, slender and brittle. Husks moderately many, medium heavy, rather loosely wrapped and easily removed. Silk pale red, scanty, short and easily removed. Husked ear moderately short and slender, 5-6 x 1⅜-1½ inches, moderately tapering; base slightly enlarged and moderately compressed; tip conical and usually capped; rows 8, rather straight, occasionally somewhat irregular and spiral at the base.

Kernels at the milk stage white; small, shallow and medium width; at dry stage dull white, thin, short and medium width, .97 x 1.15 x .34 cm. (132 seeds per oz.); short triangular in shape; crown slightly rounded; surface rather coarsely and sparsely wrinkled; set tightly on cob.

Early Leach. Refs. 345, 564.

F. H. Woodruff & Sons, Milford, Connecticut, introduced Early Leach in 1926 and continued to list it until 1929 as an early variety superior to their Early Wonder. Magruder at Ohio had this variety in trial grounds in 1929 and it was also grown at Geneva the same year.

Plant moderately short, 4-4½ feet tall; stalks slender and zigzag; tillers moderately many; tassels short and erect. Ears borne at 3rd and 4th nodes, often 2 per stalk; husked ears moderately short and medium plump, 6-7 x 1½-1¾ inches, moderately tapering; rows 8-12, mostly 8; furrows often prominent; kernels at milk stage deep creamy white; rather wide and shallow; at dry stage pale reddish bronze, medium size; set tightly on red cob.

Early Malcolm. Refs. 27, 330, 331, 332, 334, 335, 465, 498.

Early Malcolm is a sweet corn originating from the Early Malakhoff which was brought to the United

States and Canada many years ago from Russia. The selection work by Dr. W. T. Macoun and Arthur J. Logsdail was conducted at the Central Experimental Farm, Ottawa, Canada, for upwards of 30 years. This variety has served a useful purpose in advancing the season of sweet corn in all the Provinces of Canada, being 8 to 10 days earlier than Golden Bantam. Early Malcolm has been grown in every Province in Canada and while it has not been a total success as far north as has Pickaninny, yet prior to the appearance of Pickaninny it was looked upon as one of the best, hardy, early maturing varieties. It was introduced to growers in the United States in 1920 by Stokes Seed Farms Co., Moorestown, New Jersey, who continued to list the variety until 1929.

Seventy-seven days were required for this variety to produce edible ears at Geneva. This was 11 days earlier than Banana Cream, 5 days later than Early Dow, and 2 days later than Alpha. The plants are about the same height as those of Banana Cream, with decidedly less tendency to tiller and having tassels about the same length but containing many more lateral spikelets. The husked ears closely resemble those of Banana Cream in uniformity of kernel size and regularity of arrangement. In the dry stage, the kernels are much wider in proportion to the length than were those of Banana Cream. This is another of the white varieties indigenous to the more northern areas where its comparative earliness is its chief value. It is not widely grown at the present time due largely to the increase in the number of early yellow varieties that are meeting with greater approval.

Plant medium tall, 5-5½ feet; stalks slender and slightly zigzag; nodes 6-8, exposed, prominent. Brace roots usually absent. Tillers few, slightly shorter than central stalk. Leaves short and moderately narrow, 23-25 x 3-3½ inches; sheath shorter than internode. Tassel short and slender, 12-15 inches; terminal spike erect; lateral spikelets nearly erect, short, many present, crowded and branched at the base; bracts green, very sparsely striped with pale red; anthers usually buff (deep colonial buff to chamois); 54-56 days to anthesis.

Ears borne at 3rd and 4th nodes, one and occasionally two ears per stalk, one nubbin usually present. Shank moderately long and slender, 5-6 inches, brittle. Husk leaves many, medium long and moderately heavy. Husks moderately few, rather short and tightly wrapped, difficult to remove. Husked ear moderately short and slender, 6½-7½ x 1½-1¾ inches, moderately tapering; base slightly enlarged and compressed; tip long conical and very slightly exposed; rows 10-12, straight and regular, crowded around the cob.

Kernels at milk stage white, rather small, medium width and shallow; at dry stage amber white, wider than long, medium thick, .88 x 1.07 x .4 cm. (104 seeds per oz.); short broad oval in shape; crown semi-circular; surface very sparsely and shallowly wrinkled, often nearly smooth; set tightly on cob.

Early Mammoth. Refs. 22, 73, 74, 89, 90, 91, 93, 120, 126, 223, 238, 266, 376, 397, 403, 404, 405, 498, 508, 516, 537. Syns. Early Mammoth Sugar, Top Notch.

Early Mammoth as a type has persisted since its introduction in 1890 by D. Landreth & Sons, Philadelphia. Although the variety has been in existence for over 40 years, it has never been very popu-

larly received. The name has been used with several other sweet corns as in early catalogs of C. C. Morse & Co. where Early Mammoth appears with Alameda. Gregory in 1906 listed Early Mammoth, the "King of the Earlies," with the description "ripens just about with the Crosby and resembles it in number of rows, 12 to 16, in shape of kernels, and sweetness, but grows to average half as large again." This strain of Gregory's originated as a sport in a field of original Crosby.

The Early Mammoth which first appeared was described as a long slim eared variety with ears 7 to 9 inches long, 10 to 12 rows and a few days earlier than Late Mammoth. The ears of present day stock, however, will average slightly longer with 2-4 more rows. Early Mammoth produced edible ears at Geneva in 97 days, about the same season as Stowell's Evergreen and 3 days earlier than Mammoth. Plants are equal in height to those of Mammoth, possess longer internodes and are more inclined to tiller. The husked ears are of equal length but those of Early Mammoth are more slender and have fewer rows, likewise the kernels when dry are somewhat smaller, decidedly less thick and generally more attractive.

Plant tall, $7\frac{1}{2}$ -8 feet; stalk moderately heavy and straight; nodes 10-12, usually exposed and prominent. Brace roots present, rather heavy, whorl complete on one node, useful. Tillers many, equal to and slightly shorter than central stalk. Leaves long and medium broad, $34-36 \times 3\frac{3}{4}-4$ inches; sheath shorter than internode. Tassel long, 20-22 inches, somewhat heavy and coarse; terminal spike nearly erect; lateral spikelets moderately erect to slightly drooping, medium long, many, multi-branched and rather crowded; bracts green, slight to no red stripe present; anthers buff (deep colonial buff to chamois); 70-72 days to anthesis.

Ears borne at 5th and 6th nodes, one and occasionally two large ears per stalk. Shank rather long, 5-6 inches, moderately heavy. Husks many, rather heavy, short, tightly wrapped but moderately easy to remove. Husked ear long and moderately plump, $9-10 \times 1\frac{3}{4}-2$ inches; moderately to decidedly tapering; base enlarged, somewhat expanded; tip abruptly conical and often capped, occasionally exposed; rows 12-16, moderately straight, slightly irregular at the base, somewhat crowded around the cob.

Kernels at milk stage white, rather small, medium width and moderately short; at dry stage pale amber white, somewhat longer than wide, medium thickness, $1.1 \times .93 \times .36$ cm. (108 seeds per oz.); triangular; crown slightly rounded; surface rather abundantly but shallowly and coarsely wrinkled; set moderately loose on cob.

Early Market. Refs. 21, 102, 112, 121, 204, 227, 335, 345, 346, 348, 367, 478, 518, 548. Syns. Early White Market, Extra Early Market, New Sixty-Day, Sixty-Day Make Good. Illus. 25, 31.

This selection from Gill's Portland Market introduced by Gill Bros. Seed Co. of Portland, Oregon, in 1913, has risen to a prominent position among white sweet corn varieties. The name Early Market is in itself a happy choice, for growers are always on the watch for a variety combining earliness with other qualities that make it acceptable for a market sort. Early Market came indirectly from Mammoth White Cory. Selections were made by successive stages from that variety leading to the introduction of Oakview Early Market in 1901, Portland Market in 1910, and Early Market in 1913.

At Geneva edible ears were produced in 70 days, 5 days earlier than Alpha, in season with Aroostock Early and 10 days earlier than Mammoth White Cory. The plants are about the same height and vigor as those of Aroostock Early with sheaths decidedly shorter than the internodes. The ears are borne at the same height, hang at a more obtuse angle from the stalk, and have shanks which are decidedly shorter. The husked ears are much more plump, contain 2-4 more rows, and are definitely more rounded at the tip.

Early Market is widely grown in the East, the Middlewest and the Northwest as a favorite white market garden sort. It remains in a class by itself as the largest eared, extra early, white variety now grown. Were it not for the retardation of all white varieties in favor of the yellows, it seems highly probable that it would have assumed the place of importance in this generation that Cory and later Mammoth White Cory did in the preceding one.

Plant short, $3\frac{1}{2}-4\frac{1}{2}$ feet; stalks slender and straight; nodes 7-8, usually exposed and prominent. Brace roots usually not present. Tillers few to none, much shorter than central stalk. Leaves moderately short and moderately narrow, $20-25 \times 3-3\frac{1}{2}$ inches; sheath shorter than internode. Tassel moderately short and slender, 14-16 inches; terminal spike erect; lateral spikelets nearly erect, relatively few, somewhat crowded; bracts green, moderately striped with red; anthers reddish bronze (terra cotta to vinaceous russet); 53-55 days to anthesis.

Ears borne at 3rd and 4th nodes, one ear per stalk, with an additional nubbin usually present. Shank very short, $1\frac{1}{2}-2$ inches, moderately heavy and brittle. Husks many, moderately thick, short, tightly wrapped and fairly easy to remove. Silk scanty, short, quite uniformly red. Husked ear moderately short and plump, $6-7 \times 2-2\frac{1}{4}$ inches, partly cylindrical and moderately tapering; rows 12-14, regular, straight and crowded around the cob; base slightly enlarged, moderately compressed; tip rounded to abruptly conical.

Kernels at milk stage white, moderately broad, short and medium thick; at dry stage creamy white, medium size, moderately short and broad, $.9 \times 1.15 \times .45$ cm. (100 seeds per oz.); nearly square in shape; crown slightly rounded; surface rather sparsely and coarsely wrinkled; set moderately tight on cob.

Early Michigan. Ref. 296.

As a promising sweet corn for canning this strain new to Michigan growers was brought from Maine by the Roach Canning Co. of Hart, Michigan. The Jones Seed Co. of Grand Rapids, Michigan, were impressed with the high quality and uniformity of the stock and introduced it in 1913 as Early Michigan. In many respects Early Michigan resembled Crosby and was very probably a selection for earliness from that variety.

Early Minnesota. Refs. 22, 48, 61, 73, 74, 89, 91, 93, 120, 121, 123, 126, 137, 170, 200, 236, 238, 240, 241, 243, 278, 298, 335, 397, 403, 404, 405, 407, 408, 410, 411, 422, 423, 425, 427, 440, 487, 503, 507, 508, 510, 511, 512, 514, 516, 517, 525, 532, 533, 535, 536, 537, 538, 544, 546. Syns. Early Sweet Minnesota, Extra Early Minnesota, Minnesota.

The position of leadership among varieties of sweet corn held by Early Minnesota during the years 1875 to 1890 was comparable to that held by Cory in the succeeding decade, 1890 to 1900. It was con-

sidered the best of the early sweet corns and all other varieties were compared with it before they were accepted as worthy additions to the growing list. Early Minnesota was first listed about 1871 by Grant Thorburn and by Gregory and soon after by practically all seed houses. No record of the origin of this variety has been located although it was said to have been a selection from Narragansett. The variety has apparently been continued to the present day in much the same form as originally listed.

Eighty-four days were required for this variety to reach edible maturity at Geneva. This was 4 days earlier than Howling Mob, 1 week earlier than Lyman's Pride, and in season with Peep O'Day. The plants are 1-1½ feet shorter than those of Howling Mob, somewhat more slender, have less tendency to tiller but are practically identical in tassel characteristics. The husked ears are decidedly more slender than Howling Mob, and resemble those of Lyman's Pride in size, shape and kernels more closely than any other variety. The plant characters of the latter are very different, however, and serve as distinguishing features between these sorts.

Early Minnesota is one of the oldest varieties now grown. It has been used in many crosses both accidental and controlled so that its value insofar as breeding is concerned is recognized by the trade. Its uniformity and attractiveness of ear coupled with more than ordinary quality has given it the reputation associated with it.

Plant medium tall, 5-5½ feet; stalks slender and slightly zigzag; nodes 8-9, covered, not prominent; internodes slightly streaked with red on exposed portions. Tillers few, nearly as tall as central stalk. Leaves moderately long and moderately narrow, 30-32 x 3-3½ inches; sheath longer than internode, often streaked with red. Tassel moderately long and slender, 18-20 inches; terminal spike erect; lateral spiklets drooping, many, long, multi-branched, moderately crowded; bracts green, rather sparsely striped with light red; anthers usually yellowish buff (deep colonial buff to chamois), 63-64 days to anthesis.

Ears borne at 3rd and 4th nodes, one and occasionally two ears per stalk. Shank variable in length, 3-6 inches. Husks few, rather short, light, tightly wrapped. Husked ear medium long and slender, 7-8 x 1⅜-1⅝ inches, nearly cylindrical to slightly tapering; base somewhat open; tip conical, slightly exposed to capped; rows 8, distinctly paired, usually straight, somewhat irregular near base; furrows deep and moderately narrow.

Kernels at milk stage white, distinctly wide, rather shallow; at dry stage dull white, medium size, much wider than long, short and medium thick, .93 x 1.17 x .41 cm. (112 seeds per oz.); short broad oval in shape; crown rounded; surface rather coarsely yet abundantly wrinkled, often deeply ridged and irregular; set moderately tight on cob.

Early Pearl. Ref. 251. Syn. Pearl.

From Calvin Crossman of New Milford, Connecticut, we obtained the story of Early Pearl, a variety practically identical to Cupid, which was introduced by the Chas. C. Hart Seed Co., of Wethersfield, Connecticut. Some 20 years ago a Mr. Marsh of that town was spending the winter in Orange City, Florida. He became acquainted with a market gardener from New Jersey, and as one good farmer to another, the conversation led to a discussion of the merits of Golden

Bantam corn. The farmer from New Jersey admitted the good qualities of Golden Bantam but had one better, a sweeter, more tender white sort called Pearl. Mr. Marsh secured 60 kernels of this new corn, brought it home to Connecticut and passed a few seed around to his neighbors. Most of the plantings resulted in failure but the seed planted by Mr. Crossman did well and under his guidance the stock increased from year to year until M. H. Mallett, hardware dealer and local seedsman, disposed of several bushels locally every year. From Mr. Mallett the Chas. C. Hart Co. secured seed and offered it in their catalogs for 1932.

Early Pearl produced edible ears at Geneva in 84 days, 4 days later than Cupid or Sugarsweet. The plants are 1-1½ feet taller and are much more productive. The tassel type, ear and kernel characters are, however, very similar. The description of Cupid can, with the exceptions noted in this account, be considered applicable to Early Pearl. Its attractiveness and relative high production of small but good quality ears warrants further consideration of this variety. Reports from trials at the Connecticut Agricultural Experiment Station, moreover, serve to verify our conclusions.

Early Rose. Refs. 178, 533.

This sweet corn, new in 1907, came originally from G. H. Cummings, the originator of White Mexican. Henry Field Seed Co., Shenandoah, Iowa, first listed the variety and featured it for the next five years after which it was dropped because of the difficulty in retaining seed true to type. Its chief characteristic, a light rose color of the seed when ripe, distinguished this variety from any other sort. As a type it resembled the Evergreen group but was in and gone before any other evergreen was ready.

J. Steckler Seed Co. of New Orleans, Louisiana, in 1910 offered a variety called First In The Market Sugar. This was early and had ears larger than those of Crosby with "kernels of a pale pinkish color, some of the ears run entirely white while others again are of a deep pink." This might have been similar to Early Rose, but since both varieties soon disappeared from the trade, no direct comparison could be made.

Early Saskatchewan. Refs. 70, 348.

Introduced in 1927 by the Burgess Seed and Plant Company, Galesburg, Michigan, this variety has produced very uniform and attractive ears in the trials at Geneva. No information is available concerning its origin, and apparently it has not been cataloged by anyone other than the introducer. By comparison Early Saskatchewan has proved to be much like Banana Cream, with the husked ears much alike in shape, size and kernels. The plants, however, were more variable, some considerably taller and produced its crop 5 to 6 days later.

Plant medium tall, 5-5½ feet; stalks moderately heavy and slightly zigzag; tillers many, equal to central stalk in height; tassel medium long and slender, 16-18 inches with laterals distinctly long and horizontal. Husked ears medium long and moderately slender, 7-8 x 1½-1⅝ inches, nearly cylindrical, slightly tapering; rows 12, straight and crowded around the cob; kernels at milk stage white, small, rather narrow and shallow.

Early Southern Sweet. Refs. 22, 90, 91, 169, 508, 511, 535, 536. Syns. Early Southern, Southern.

This variety was a true hybrid corn, being the result of crossing Minnesota on the "Cuzco, a Mexican species with very tall stalks and short, thick ears, bearing grains as large as chestnuts." D. M. Ferry & Co. made the cross in 1832 and after selecting for 6 years introduced it in 1888. The plants were like Minnesota in size with stiff broad foliage, and bearing medium length 10-rowed ears covered with thick, coarse husks. The grain was large with a rather thick skin, but sweet and good.

Early Sugar, Livingston's. Ref. 325. Syn. "Early Sugar".

This is a variety which was introduced in 1911 by the Livingston Seed Co., Columbus, Ohio. Although the introducing company have continued it as a leading variety, it has not been generally listed by the trade, at least under the name Early Sugar. Although listed as an addition to the early sweet corns, Early Sugar on the basis of its performance at Geneva belongs in the midseason group, having required on the average of 92 days to reach edible maturity. In the uniformity, attractiveness and color of the ears it much resembles those of Burpee's Branching. However, the lack of the bushy habit of the plants due to lessened tendency to tiller serves to partially distinguish the two.

The outstanding characteristics of the variety seem to be the vigor of the plant which at Geneva was tall, $6\frac{1}{2}$ – $7\frac{1}{2}$ feet with heavy stalk with few to no tillers present. The husked ear was medium long and medium plump, 7 – $8 \times 1\frac{5}{8}$ – $1\frac{3}{4}$, moderately tapering, and occasionally capped at the tip. The 12–14 rows of kernels were rather small and shallow, very attractive, while the kernels in the dry stage were distinctly opalescent white in color.

Early Sunrise. Refs. 64, 207, 208, 238, 241, 280, 348, 406. Syns. New Early Sunrise, Sunrise, White Sunrise.

The Iowa Seed Co., Des Moines, Iowa, introduced this variety in 1899 and has featured it continuously. H. W. Buckbee, Rockford, Illinois, in 1901 offered a prize of \$100 for the best name sent in and accepted for a remarkable new sweet corn variety. The next year, 1902, this was announced as Buckbee's Early "Sunrise" sweet corn. According to the catalogs of the Iowa Seed Co., this sort originated with a farmer in western Iowa who had perfected it by 8 years selection. As grown at Geneva it was a midseason variety in season with Peep O'Day, Early Minnesota, Early Fordhook, and Vanguard. The plant was rather tall, about 6 feet, slender, with a light feathery tassel, and ears 6 inches long, 10 to 12-rowed with a small white cob.

Early Sweet. Refs. 36, 89, 91, 167, 207, 208, 410, 418, 507, 508, 514, 535, 536. Syn. Early Sugar.

D. M. Ferry & Co. introduced Early Sweet or Sugar in 1875 or thereabouts and it has remained continuously in the catalogs of Ferry and the succeeding company, Ferry-Morse. The early descriptions of the variety are not wholly in agreement as to the length of ear but after 1895 the type seems to have been rather definitely

fixed as a long, slender, $7\frac{1}{2}$ to 9-inch eared variety. The name Early Sweet was also used for the variety better known as Dwarf Early as well as for others of its group, but since these varieties are no longer popular there is now no conflicting use of name.

Edible ears were produced at Geneva in 87 days, about the same season as Howling Mob, 5 days later than Independence and 3 days earlier than Mimms' Hybrid. The variety most resembles Independence with plants the same height and vigor, similar feathery tassels but with anthers more consistently striped with red. The husked ears are 2–3 inches longer, slightly more tapering, and capped at the tip; otherwise are much the same. The attractiveness of a long, regular 8-rowed sweet corn is well brought out in this variety. To those who have desired a delicate ear with all suggestion of the colossal absent, this sort has been offered. Because of these characters it has been confined to planting in the home and market garden.

Plant moderately tall, 6 – $6\frac{1}{2}$ feet; stalks very slender and slightly zigzag; nodes 7–8, slightly exposed, moderately prominent; internodes streaked with red on exposed portions. Tillers few, much shorter than central stalk. Leaves medium long and moderately narrow, 30 – $32 \times 3\frac{1}{4}$ – $3\frac{1}{2}$ inches; sheath equal to and occasionally shorter than internode. Tassel moderately long and slender, rather feathery, 18–20 inches; terminal spike erect; lateral spikelets horizontal to slightly drooping, moderately many, long and somewhat crowded; bracts and anthers variable in color; 60–62 days to anthesis.

Ears borne at 3rd and 4th nodes, one and occasionally two ears per stalk, one usually a nubbin. Shank medium long and slender, 3–5 inches. Husks few, rather light, medium length and moderately tight wrapped. Husked ear long and slender, 8 – $10 \times 1\frac{1}{4}$ – $1\frac{1}{2}$ inches, nearly cylindrical and slightly tapering; base compressed and occasionally open; tip long conical and occasionally capped; rows 8, straight, usually paired, with furrows deep but very narrow, not prominent.

Kernels at milk stage white, medium size, moderately broad and shallow; at dry stage small, wider than long, very thick, $.88 \times 1.0 \times .45$ cm. (124 seeds per oz.); decidedly short oval in shape; crown rounded; surface rather sparsely and shallowly wrinkled; set tightly on cob.

Early Vermont. Refs. 77, 121, 207, 208, 450, 454, 513, 514. Syn. Extra Early Vermont.

No early sweet corn introduced during the "gay nineties" survived even its baptismal season unless its sponsors were able to show its superiority to Cory. Cory earliness, Cory quality, became the measuring stick for varieties in this class, and like all winners, it seems as though every seed company aspired to be the sponsor of that new corn which would dethrone the great Cory. Naturally in this competitive rivalry many varieties were introduced that had no greater points of divergence than the difference in the vocabularies of the catalog writers striving to transfer stocks of seed from warehouse to grower. And so Early Vermont "the market man's money maker," "the pride of the home garden," "the epicure's delight," was launched in 1894 by Frank Ford & Son of Ravenna, Ohio, and Vaughan's Seed Store of New York. For a few years Early Vermont was quite popular as measured by the number of other companies which

featured it in catalog descriptions. It was supposed to have come as the result of a cross between a late and an early variety. The cob was white, ear 6 to 8 inches long, 8-rowed with very large white grains. At the time of its introduction it was given as earlier than Cory and Pride of America but 2 years later it was listed as later than Cory, Fordhook Early or First of All.

Early Wonder. Refs. 231, 345, 348, 483. Syn. Extra Early Wonder.

I. N. Simon & Son, Philadelphia, introduced Early Wonder in 1913 as a sweet corn which is "truly a wonder." The name "Wonder" has been used in connection with other sweet corns, among them the New Early Wonder in 1910 by Henry Phillips, Toledo, Ohio, and Early White Wonder in 1913 by A. C. Kendel, Cleveland, Ohio. Comstock, Ferre & Co. have a stock of Early Wonder which came to them along with other material from the Thomas Griswold Co.

The history of Early Wonder is unknown although it is thought by some to have come as a selection from Columbia. The plantings of this variety at Geneva have been grown from seed from Simon and Comstock, Ferre, so that the data for the description of Early Wonder is based on these stocks.

Eighty days were required for this variety to reach edible maturity at Geneva. This was 3 days later than Surprise, in season with Whipple's Early and Mammoth White Cory, and 5 days later than Alpha. The plants are $1\frac{1}{2}$ feet taller than those of Surprise, having tillers considerably taller in proportion to the central stalk and more variable in bract and anther color. The husked ears are 1 to 2 inches longer than those of Surprise, slightly more conical and more often exposed at the tip. Likewise the kernels at the dry stage are somewhat longer in proportion to the width. This is another one in the medium early class of white sweet corn that has been used in the market garden sections of the East and Middlewest.

Plant moderately tall, 6 feet; stalks moderately slender and straight; nodes 8-9, exposed, prominent. Brace roots present, moderately heavy, whorl nearly complete, somewhat useful. Tillers few, equal in height to central stalk. Leaves moderately long and medium broad, $32-34 \times 3\frac{3}{4}-4\frac{1}{2}$ inches; sheath shorter than internode. Tassel medium long, 15-18 inches, slender; terminal spike erect; lateral spikelets nearly erect, medium long, moderately many, rather scattered, multi-branched; bracts and anthers variable; 60-62 days to anthesis.

Ears borne at 3rd and 4th nodes, one and often two ears per stalk, otherwise an occasional nubbin present. Shank medium long, 4-5 inches, rather heavy. Husk leaves rather short and heavy. Husks moderately many, heavy, medium length, rather loosely wrapped and easily removed. Husked ear medium long and moderately plump, $7-8 \times 1\frac{3}{4}-2$ inches, slightly tapering, attractive; base slightly enlarged; tip conical and very slightly exposed; rows 10-12, moderately straight, slightly irregular at the base, occasionally lost.

Kernels at milk stage white, rather large, broad and medium depth; at dry stage dull amber white, longer than wide, $1.17 \times .94 \times .39$ cm. (115 seeds per oz.); triangular; crown very slightly rounded; surface shallowly and rather coarsely wrinkled; set moderately tight on cob.

Eastman's Early. Refs. 108, 238. Syn. Eastern Extra Early.

This variety was first offered by the Eastman Seed Company, East Sumner, Maine, sometime prior to 1898. A test of 41 varieties at the New Hampshire Experiment Station substantiated the claim of the introducer as being the earliest of any sweet corn. The strain was originated by a Mr. Eastman of Maine. The ears were 6 to 7 inches long, 8 to 12 rows, slightly earlier than Peep O'Day. It was very similar to First of All (Dreer).

Egyptian. Refs. 22, 61, 73, 74, 75, 89, 91, 93, 121, 168, 214, 236, 238, 368, 397, 403, 405, 411, 412, 422, 423, 435, 464, 487, 503, 507, 508, 511, 512, 514, 515, 533, 535, 536, 537, 538, 545. Syns. Early Egyptian, Egyptian Sugar, Egyptian Sweet, Large Egyptian, New Egyptian, Washington, Washington Market.

Whatever the origin of this sweet corn references to early catalogs show that it was generally carried by the larger seed houses beginning about 1880. In 1883 both Gregory and Ferry considered it noteworthy for productiveness and sweetness. Gregory gives the credit for its introduction to a Mr. Hyde as it was once known as Hyde's Egyptian. Descriptions show a late variety maturing with Stowell's Evergreen and resembling that variety in many respects but with kernels wider and shallower.

At Geneva 98 days were required for edible ears to be produced. This was in season with Stowell's Evergreen, 3 days later than Henderson and 1 day later than New Wonder. The plants are much like those of New Wonder. The tassel bracts are decidedly less striped with red, often entirely absent in comparison to those of Stowell's Evergreen, while the general foliage color is somewhat lighter green. The ears are borne slightly lower on the stalk than those of New Wonder, and are decidedly less numerous. The husks are longer, but just as tightly wrapped and difficult to remove. The husked ears are about the same length but decidedly more plump. In the dry stage the kernels are set more loosely on the cob. This old variety was used principally as a canning sort, and as such was widely grown, particularly in the East, the Middlewest, and in the region of the Great Lakes.

The description to follow is based on data obtained from the few stocks still available. Consequently some deviation may exist in comparison to the original Egyptian.

Plant tall, 7-8 feet; stalks heavy and straight; nodes 12-14, nearly covered, not very prominent. Brace roots present, heavy, complete on one node and part of another, useful. Tillers few to none, slightly shorter than central stalk, leaves long and medium width, $34-36 \times 3-4$ inches; sheath equal to and occasionally longer than internode. Tassel moderately long, 18-20 inches, coarse and heavy, occasionally colored at the base; terminal spike erect, lateral spikelets moderately erect to slightly drooping, medium length, rather numerous and crowded; bracts green, very slight to no red stripe present; anthers buff (deep colonial buff to chamois); 74-76 days to anthesis.

Ears borne high, at 6th and 7th nodes, one and often two ears per stalk with an occasional nubbin also present. Husk leaves few,

short and light. Husks many, long, rather light but tightly wrapped, particularly about the tip, difficult to remove. Silk moderately long, abundant and red in color. Husked ear moderately long and moderately plump, 8-9 x $1\frac{1}{8}$ -2 inches, moderately tapering; base somewhat enlarged but compressed; tip conical and slightly exposed; rows 14-16, moderately straight, occasionally lost at the medial, crowded around the cob.

Kernels at milk stage white, small, narrow and short; at dry stage opalescent white, much longer than broad, 1.1 x .78 x .39 cm. (164 seeds per oz.); triangular; crown nearly straight; surface rather sparsely and shallowly wrinkled; set rather loosely on cob.

Eight-Rowed. Refs. 13, 22, 59, 65, 73, 89, 90, 91, 93, 173, 207, 208, 214, 364, 397, 405, 406, 414, 417, 427, 428, 482, 503, 507, 508, 514, 533, 536, 537, 552. Syns. Brigg's Early Sweet, Earliest Large, Early Eight-Rowed, Early Eight-Rowed Sugar, Early Large Eight-Rowed, Eight-Rowed Sugar, Large Eight-Rowed Sugar, Late Eight-Rowed, Mammoth Sweet Eight-Rowed, New England, New England 8-Rowed, New England Eight-Rowed Early, New England Sugar, New England Sweet, North Pole, Rochester, Rochester Eight-Rowed.

When only one variety existed to represent any one of the separate types the name chosen for that variety could well have been a name that in itself expressed some characteristic of the variety. Thus Eight-Rowed Early signified an early variety with 8-rowed ears. When the word Dwarf was added to this then it of course became dwarf, early and 8-rowed. Likewise the words sweet or sugar appended to a name indicated that the variety was particularly noted for this quality. Eight-Rowed was offered in the catalogs of the early seed merchants with all the possible combinations of these descriptive adjectives.

As the number of varieties grew and as selections made on the basis of minor differences in plant or ear were offered it became more and more difficult to arrange these few words in the name so as to indicate the actual differences. In a relatively short period there were perhaps 5 to 10 strains that came under the general classification of 8-rowed each presumably separated by the terms early, dwarf, late, large, sweet, etc. Eventually these qualifying words fell into disuse which led to the removal of the name Eight-Rowed from catalog use, inasmuch that it did not sufficiently separate one 8-rowed variety from another.

Eight-Rowed as such was first listed about 1867. Sturtevant writes in the report of 1884, "very likely the sweet or sugar of Bridgeman, 1832, and the Eight-Rowed Sugar of Schenck, 1854." All available descriptions of this variety very strongly indicate that, although the word early was used, it reached edible maturity in New York State anywhere from 86 to 93 days and produced vigorous plants with long ears. The description to follow represents a compilation of Sturtevant's work with that of Burrill and McClure.

Plant moderately tall, 6-7 $\frac{1}{2}$ feet or more, stalks rather slender, tillers few; tassel slender and drooping. Ears borne 20-30 inches from the ground; husked ears long and moderately plump, 8-10 x $1\frac{5}{8}$ -1 $\frac{7}{8}$ inches, strongly tapering from the medial to the apex; rows 8, often separated in pairs, especially near the base;

kernels in milk stage white; at dry stage dull white, broadly rounded over the crown, broader than deep, $\frac{1}{2}$ inch wide, $\frac{3}{8}$ inch deep crinkled."

Everbearing. Refs. 76, 97, 126, 350, 351, 367, 368, 403, 411, 443, 509, 510, 513, 533, 535, 537, 538. Syn. New Everbearing.

Everbearing, when introduced by Wm. Henry Maule, Philadelphia, in 1892, and W. Atlee Burpee Seed Co., presented a rather new and distinct plant type. The husk and stalks were of a distinct red color and as an additional feature "the stalk usually produced 2 good ears; when these ears were taken off another lot of ears set and developed on the same stalk." The editor of the Rural New Yorker raised the question as to how this new set was pollinated, for unless new tassels were also present there would not be fresh pollen for the late ears. The second set was probably the ears on the tillers which received their pollen at the same time as the early ears, the development of these ears being delayed. As reported by Price and Drinkard the plant of Everbearing was above medium in height, stout and a healthy grower with ears short, small and with 12 rows. The variety was listed for about 10 years although the name has been used in late years as a synonym of Howling Mob.

Extra Early Dawn. Ref. 229.

This variety, offered sometime previous to 1914 by Thos. Griswold & Co. of South Wethersfield, Connecticut, was in no way similar to the variety listed in 1892 by Johnson & Stokes as Early Dawn. It had been in use for many years and was introduced as the earliest sweet corn in cultivation. It was undoubtedly a selection from Red Cory and originated in Vermont. In form, size and appearance it somewhat resembled that variety but was a week or ten days earlier. For a few years it was quite popular. It was listed by Joseph Harris in 1912, as Early Dawn by Thorburn in 1919 and by Vick in 1922, the latter describing it with ears 6 inches long, 8 rows of clear juicy kernels sometimes tinged with red. The strain which became Early Dighton probably came as the result of selection from Extra Early Dawn.

Farmers' Club. Refs. 9, 14, 215. Syns. Farm Club, Farmers' Club Sweet, New York Farmer's Club, Olcott, Olcott's Farmers' Club, Trimble, Trimble's Improved, Trimble's Sugar.

The first notice of this unusual variety, according to available records, appeared in the 1869 catalog of James J. H. Gregory, Marblehead, Massachusetts, although a year later it was offered by other seedsmen, including Dreer and Hovey. At that time it was reported that the entire plant was of a red caste, but producing white ears "remarkably sweet and tender." Dreer called it the "richest, sweetest, tenderest of all with stalks and leaves medium size, heavily marked with purple."

Recently a variety of sweet corn called Farmers' Club, which appeared to fit the above description, was observed at Milford, Connecticut. Dr. D. F. Jones of the Connecticut Agricultural Experiment Station, New

Haven, Connecticut, says, "We have grown Farmers' Club corn for a number of years, the seed being obtained from Mr. Walter Olcott, South Manchester, Connecticut. Mr. Olcott states that this variety has been in his family for some time, and does not know its origin." It has been reported to be outstanding for quality, quite similar in this respect to Cupid or Sugarsweet of Henderson. In season it is about the same as Golden Bantam. The description to follow is that of the Olcott stock and will serve to indicate the individualism of the variety.

Plant medium tall, 5-5½ feet; stalk distinctly zigzag and slender; nodes 9-10, distinctly exposed, solid red in color; internodes red; tillers very many, equal in height to central stalk. Leaves dark green with margins and midribs deep red; sheath much shorter than internodes, heavily shaded with red. Tassels medium long and heavily shaded with red.

Ears borne at 4th and 5th nodes, 2 ears per stalk with nubbin often appearing on tillers; husk leaves moderately long, same color as regular leaves. Husked ears moderately short and slender, 6-7 x 1⅜-1½ inches, nearly cylindrical, slightly tapering; tip abruptly conical, exposed; rows 8-10, straight, crowded around cob.

Kernels at milk stage white, rather small, shallow, very sweet; at dry stage dull white with a very slight pinkish cast; ovate; slightly and shallowly wrinkled; set tightly on white cob.

Favorite. Ref. 104.

Favorite, first listed in 1926 by Cassel's Seed Store, Lansdale, Pennsylvania, was one of the very latest varieties in the trials at Geneva. Its origin is unknown, and as compared to all other varieties grown in our trials was quite distinct. The type, however, was similar to the descriptions given for Triumph in earlier writings and therefore it would seem as though this variety resulted as a selection from one of the old 8-rowed, long, slender-eared sorts, all of which were late in season.

At Geneva 98 days were required to produce edible ears. This was in season with Stowell's Evergreen, 4 days later than Nectar and 2 days earlier than Mammoth Sugar. The plants of this variety most resemble those of Nectar, being of equal height but consistently inclined to tiller more freely. Both have green bracts on the tassels with decidedly less striping than occurs on Stowell's Evergreen. The ears, however, are borne higher on the stalk, not inclined to be pendant as in Nectar, and possess fewer but considerably longer husks. The husked ears are 1 to 2 inches longer, decidedly more tapering at the apex, and contain 8 rows more often than 12, the latter number being present in Nectar. This is one of the less coarse-appearing late varieties that has proved to be exceptionally sweet and tender. It should be a popular home garden variety for those who dislike the larger eared sorts.

Plant tall, 7-8 feet; stalks heavy and straight; nodes 12-14, usually covered, not prominent. Brace roots present, heavy, useful and complete on one node, non-functional ones present on second node. Tillers many, slightly shorter than central stalk, often bear good ear. Leaves long and medium broad, 34-36 x 3½-4 inches; sheath equal to and often longer than internode. Tassel moderately long, moderately heavy and coarse, 18-20 inches; terminal spike erect; lateral spikelets moderately erect to slightly drooping, short to medium long, very many, decidedly crowded and branched at the base; bracts green, very slight to no stripe; anthers variable in color; 74-76 days to anthesis.

Ears borne at 6th, 7th and 8th nodes, two ears per stalk with an additional nubbin usually present. Shank medium long, 4-5 inches, heavy and tough. Husk leaves moderately many, decidedly short and light. Husks moderately few, long, tightly wrapped and rather difficult to remove. Husked ear long and moderately slender, 9-10 x 1⅜-1¾ inches, slightly tapering to moderately cylindrical; base rounded and compressed; tip long and conical, slightly exposed and occasionally capped; rows 8-12, straight, occasionally irregular at the base, rather crowded around the cob.

Kernels at milk stage white, medium size, moderately thick; at dry stage nearly white, slightly longer than wide, rather thin, 1.1 x 1.0 x .34 cm. (124 seeds per oz.); definitely triangular in shape; crown very slightly rounded; surface abundantly, finely and shallowly wrinkled, sides more or less creased and depressed; set slightly loose on cob.

First Prize. Ref. 186.

Introduced in 1923 by Alexander Forbes and Company of Newark, New Jersey; this variety has proved at Geneva to be much like Howling Mob. No information is available concerning its origin. The variety ceased to be listed after 1928.

At Geneva it produced edible ears in 87 days, practically the same season as Howling Mob and Alameda Sweet. The plants were about 6 to 8 inches shorter than those of Howling Mob, less streaked with red, and much less inclined to tiller. The husked ears were of equal length, but slightly more plump at the base and correspondingly more tapering.

Plant moderately tall, 6-6½ feet; tillers few, much shorter than central stalk. Ears borne at 4th and 5th nodes, one and two per stalk. Husked ear moderately long and plump, 7-9 x 1⅜-2¼ inches, decidedly tapering; rows 12-16, slightly irregular at the base.

Five-Eared Sugar. Refs. 372, 406.

In 1907, H. W. Johnson found among his trial grounds a stalk of corn containing five well-filled ears. This was saved and subsequently selected for two years. In 1909, the Johnson Seed Company of Philadelphia introduced it to the trade. The ears were of medium size and had irregular rows. The introducer says, "It was somewhat similar to the old Shoe Peg, which was one of its parents, but was earlier and deliciously sweet." The variety was carried by Johnson until the organization dissolved. It apparently never obtained more than the status of a novelty.

In 1914, the Moore Seed Company of the same city introduced a variety under the name of Shallcross' Five-Eared Sugar. This was a vigorous grower having plants 9 to 10 feet high and producing ears 8 inches long containing 10 to 12 regular rows, supposedly well filled and attractive. It was only listed for a few years and not known to any extent.

Floracraft Beauty.

Little is known concerning the origin of this sort, named after the Stokes trial grounds. The Walter P. Stokes Seed Company of Philadelphia listed it about 1913, but soon discontinued it in favor of Kendel's Early Giant. It was one of the parents used by Arthur L. Richie in producing Sunnyslope Special. The meagre information at hand indicates that it was an early corn having ears 6 to 7 inches long with 10 to 12

rows of good sized deep grains. The plants were 5 to 6 feet tall, often producing two ears per stalk.

Ford's Early. Refs. 22, 90, 91, 188, 328, 329, 345, 350, 412, 427, 450, 454, 507, 508, 510, 512, 518, 533, 537, 538. Syns. Ford's, Ford's Early Sweet.

Ford's Early was first sent out for trial by Frank Ford & Son, Ravenna, Ohio, in 1881. It was also listed by Vaughan and by Goodell in 1883. Some growers and seedsmen considered it as a synonym of Early Minnesota, but as grown in our trials it showed certain characteristics which would tend to place it as a separate variety. When first introduced it probably was more like Minnesota since it reputedly arose through selection and not as the result of a cross.

Eighty-five days were required for ears to reach edible maturity at Geneva; which proved to be 3 days later than Fordhook Early, about the same season as Kendel's Early Giant, and 2 days earlier than Crosby. The plants are the same height as those of Fordhook but somewhat heavier and straighter with the few tillers much taller in proportion to the central stalk. The ears are borne about the same position but are attached to shanks that are considerably shorter. The husks are more loosely wapped and easier to remove. The husked ears are slightly longer, more consistently 8-rowed, and contain kernels which in the dry stage are not as noticeably broad as those of Fordhook. This old variety has been used for the market garden in the Middle West for many years and has enjoyed an enviable reputation for consistent performance.

Plant medium tall, $5\frac{1}{2}$ -6 feet; stalks moderately heavy and slightly zigzag; nodes 7-8, exposed, prominent; internodes distinctly long. Brace roots present, slender, whorl complete and moderately useful. Tillers few, slightly shorter than central stalk. Leaves short and medium broad, $20-25 \times 3\frac{1}{2}-4$ inches; sheath shorter than internode. Tassel medium long and slender, 15-18 inches; terminal spike erect; lateral spikelets drooping, many present, crowded and multi-branched; bracts green, moderately striped with red; anthers usually some variation of reddish bronze (terra cotta to vinaceous russet); 62-64 days to anthesis.

Ears borne at 3rd and 4th nodes, one and very often two ears per stalk, one nubbin usually present. Shank medium long and heavy, 4-5 inches. Husks moderately many, heavy, rather short and loosely wrapped, easily removed. Husked ear moderately long and moderately slender, $7-9 \times 1\frac{3}{8}-1\frac{5}{8}$ inches, slightly tapering and partly cylindrical; base slightly enlarged and expanded; tip abruptly conical, slightly exposed and occasionally capped; rows 8, occasionally paired, straight, usually crowded around cob, paired rows with furrows deep and narrow.

Kernels at milk stage white, medium size, broad, rather shallow and thick; at dry stage dull white, broader than long; .90 x 1.16 x .41 cm. (100 seeds per oz.); short broad oval in shape; crown semi-circular; surface sparsely and very shallowly wrinkled; set tightly on cob.

Genesee. Refs. 22, 430, 434, 443, 507, 508, 533, 537, 538. Syns. Crossman's Genesee, Genesee Early, Genesee Early Sugar.

This sort is supposed to have originated as a cross involving Minnesota Early and Amber Cream and according to Sturtevant was introduced to the trade in 1883. Indications are that it was never widely cataloged, although apparently was in existence for 30 years or more, having appeared in the 1913 catalog

of the Philip-Thompson Co. of Wilmington, Delaware. This organization apparently considered it a variety of some consequence, as they say "Genesee Early Sugar produces larger ears than other varieties of early sugar corn, in fact, nearly as large as the late varieties. It is very hardy, and may be planted almost as early as the Adams and other like varieties, while it surpasses them so far in quality that they are unsalable as soon as the Genesee Early comes on the market."

The description to follow is based largely on Sturtevant's description of the dry ears. No more recent data are available.

Plant medium tall, 5-6 feet, with ears borne about 10 inches from the ground. Dry ears $6-7 \times 1\frac{1}{2}$ inches, nearly cylindrical but tapering near the tip; base compressed; rows 12, moderately straight, crowded around the cob; kernels at dry stage whitish amber, blunt, wedge-shaped; crown slightly rounded, diverging; surface rather deeply wrinkled; set tightly on cob.

Governor Gilman. Ref. 283.

The Iowa Seed Company of Des Moines, Iowa, introduced this sort in 1913. It originated with Gilman of Minnesota as the result of a cross between Golden Bantam and an unknown larger early white variety. Although the variety produced both white and yellow kernels, it was reputed as possessing unexcelled quality. As far as can be determined, the variety was only carried by the one organization and was discontinued by that one in 1920. No specific data are available, although a catalog illustration indicates it to be a 12- to 14-rowed ear about 6 to 7 inches long.

Granite State. Refs. 182, 195.

Little information is at hand concerning this variety. It was introduced by Fottler, Fiske and Rawson in 1911, and with the exception of 1914 and 1915, carried until 1924 when the firm was reorganized as the Fiske Seed Company. This organization listed the stock one year and then dropped it.

The variety was reputed to be similar to that of Moore's Concord, but apparently earlier. The plants were about 5 feet high, bearing their "large ears for early corn" well down on the stalk. The husked ears were 7 to 9 inches long and had 12 to 14 rows of kernels well filled at the tip.

Guarantee. Refs. 290, 368, 510.

Introduced about 1892 by Johnson and Stokes; this variety was procured from a market gardener of Chester County, Pennsylvania. Nothing further is known of the stock from which it was derived. It was apparently very popular with the customers, since the introducers remark, "We have seen his supply of this corn sold out before 8 o'clock in the morning, long before the market was half over, notwithstanding the fact his price was always 10 cents per dozen above his competitors."

Although never grown at Geneva, the Michigan Station reported it to be about in season and general appearance with Everbearing. The plants were 5 feet tall, produced ears 8 inches long which were slender, very sweet, and with a white cob.



LONG ISLAND BEAUTY

(Two-thirds natural size)



MAMMOTH

(Two-thirds natural size)

Hance's Early. Refs. 207, 208, 405, 533.

A. W. Livingston's Sons, Columbus, Ohio, offered this new variety in 1895. A customer "down East" had sent a peck of seed from a strain which had been selected and grown for many years. It was quite superior to the corn his neighbors grew, so much so that it enabled him to "lay in the shade" his fellow marketers. An illustration in the 1897 catalog shows a rather long ear with 8 rows and broad kernels. In season it was considered a second early. Livingston listed Hance's Early for nearly 10 years, when it was dropped in favor of some of the larger eared new varieties.

Hematite Sweet. Ref. 468.

This variety was mentioned by J. H. Salisbury in 1848 as having an 8-rowed ear with white kernels and a red cob. No record of the cataloging or growing of this corn has been found, but it probably was the form from which Red Cob Sweet was selected. The name Hematite, one of the important iron ores, was probably considered quite appropriate to use to designate redness of cob.

Henderson. Refs. 22, 61, 90, 91, 125, 126, 207, 208, 238, 241, 258, 350, 397, 403, 405, 508, 509, 512, 515, 533, 535, 536, 537, 538.

This variety originated as a selection from Hickox and was developed by C. W. Beardsley of Milford, Connecticut. It was introduced by Peter Henderson in 1887 and continues to be listed to the present time.

At Geneva edible ears were produced in 96 days, 4 days later than Metropolitan, 2 days earlier than Stowell's Evergreen, and about the same season as Country Gentleman. The plants are 1 to 1½ feet taller than those of Metropolitan, have less tendency to tiller, and are more streaked with red on the tassels. The husked ears are longer and somewhat more plump, having from 2 to 4 more rows of kernels. The kernels in the dry stage are not quite as long in proportion to the breadth as those of Metropolitan, but otherwise are very similar. This is one of the large late varieties that have been so popular on the New York market.

Plant tall, 7½-8 feet; stalks straight and moderately heavy; nodes 10-12, slightly exposed, moderately prominent, slightly streaked with red at the base. Brace roots present, heavy, whorl complete and useful on one node. Tillers few, slightly shorter than central stalk. Leaves moderately long and medium broad, 32-34 x 3½-4½ inches; sheath slightly shorter than internode. Tassel long and heavy, 20-22 inches, often streaked with red at the base; terminal spike erect; lateral spikelets moderately erect, medium long, many present, crowded, multi-branched; bracts and anthers variable in color; 71-73 days to anthesis.

Ears borne at 5th and 6th nodes, one and occasionally two ears per stalk, one usually a nubbin. Shank long and heavy, 5-8 inches. Husk leaves moderately long and many. Husks many, short, heavy, rather tightly wrapped and somewhat difficult to remove. Husked ear long and moderately plump, 9-10 x 1⅞-2¼ inches, slightly tapering; base moderately compressed to slightly open; tip abruptly conical and nearly capped; rows 12-16; moderately straight, regular, moderately crowded around the cob.

Kernels at milk stage white; small, narrow and short; at dry stage dull white, longer than broad, .95 x .88 x .4 cm. (112 seeds per oz.); somewhat blunt, triangular in shape; crown rounded; surface abundantly and rather shallowly wrinkled; set moderately tight on cob.

Hiawatha. Refs. 238, 259, 403.

C. W. Beardsley of Milford, Connecticut, originated this variety as a selection from Crosby's Early. Seed was obtained by the Peter Henderson Company of New York who introduced it in 1906 and carried it until 1920. It was apparently much like Crosby with plants about 5 feet tall producing ears about 8 inches long with 12 to 14 and occasionally 16 rows of medium sized, deep kernels. It was well wrapped with heavy husks and reputed to have remained for a considerable period in the milk stage.

Hickox. Refs. 22, 35, 61, 73, 74, 89, 90, 91, 238, 240, 241, 275, 278, 344, 350, 367, 368, 397, 403, 411, 423, 431, 435, 487, 503, 507, 508, 511, 515, 517, 533, 535, 536, 537, 538. Syns. Creedmoor, Hickox Canner, Hickox Canning, Hickox Improved, Hickox Improved Sugar, "Mammoth Sugar," Sugar Giant.

Hickox from the time of its introduction about 1883 to the present time has been considered as a standard variety for canning. Little is known of its early history. It was listed by Gregory in 1885, by Ferry in 1888, and by nearly all seed merchandizers during the nineties. Since it most resembles other varieties in the Late Mammoth group, it probably originated as a selection from one of these sorts. There is some indication that when first introduced an occasional cob appeared showing a red stain in the interior. Early descriptions also show a variance of from 8 to 12 in the number of rows on the ear.

Ninety-seven days were required for Hickox to produce edible ears at Geneva. This proved to be in season with Country Gentleman, 10 days later than Crosby and 1 day earlier than Stowell's Evergreen. The plants are equal in height to those of Stowell's Evergreen, have fewer tillers, and have nodes more consistently covered by the sheath. The husks are longer and somewhat more tightly wrapped, while the husked ears are about the same length but less plump and more cylindrical, containing only 12 rows instead of 16 to 18. Hickox is more widely used in this State today as a white canning corn than any other white variety. Its consistent high yield of good quality corn has made it highly deserving of the place it fills in the growers' program.

Plant tall, 7-8 feet; stalks moderately heavy and straight; nodes 10-12, usually covered, not prominent. Brace roots present and complete on one node, heavy and useful. Tillers few, much shorter than central stalk. Leaves long and medium broad, 34-36 x 3¾-4½ inches; sheath equal to and longer than internodes. Tassel moderately long and heavy, 18-20 inches, occasionally colored at the base; terminal spike erect; lateral spikelets slightly drooping, moderately many present, long and rather crowded; bracts green, moderately striped with red; anthers somewhat variable in color; 71-73 days to anthesis.

Ears borne at 6th and 7th nodes, one and often two ears per stalk, one occasionally a nubbin. Husk leaves short and light. Husks many, heavy, long and tightly wrapped, not easily removed. Husked ear moderately long and moderately plump, 8-9 x 1¾-2 inches; moderately cylindrical and slightly tapering; base enlarged and compressed; tip conical and slightly exposed; rows 12, regular, moderately straight, crowded around the cob.

Kernels at milk stage white, moderately wide, medium depth and thickness; at dry stage clear, almost translucent white, medium

size; medium width, rather long and medium thick, 1.1 x .85 x .40 cm. (140 seeds per oz.); long triangular in shape; crown slightly rounded; surface shallowly, abundantly and finely wrinkled; set tightly on cob.

Honey. Refs. 11, 22, 63, 90, 91, 126, 207, 274, 367, 368, 403, 442, 444, 508, 509, 510, 518, 533, 536, 537. Syns. Honey Sweet, New Honey Sweet, The Honey.

This is another of the red foliage varieties of past decades. It originated with a German market gardener near Allentown, Pennsylvania, and was introduced at least as early as 1890, at which time it was featured by J. J. H. Gregory. J. J. Bell of Windsor, New York, listed it in 1892, as did Johnson & Stokes a year later.

In many respects it was apparently much like Crosby. Reports indicate, "Plants taller than those of Crosby and will average more ears per stalk, of about the same shape, size and number of rows, though the rows are not quite so close together. . . . The objections to the Honey Sweet for market would be its purple husks."

Honey Boy. Refs. 345, 471.

This was introduced by the John A. Salzer Seed Company, La Crosse, Wisconsin, in 1920, and has continued to be listed to the present time. As grown at Geneva it has proved to be somewhat variable from year to year, not always producing consistently the type as originally sold. Inasmuch as available information from the introducers indicates it to be a very early sort, the data obtained at Geneva for those years that properly indicate its season here have been used.

Plant moderately short, 4½-5 feet; stalks slender and moderately straight. Ears borne at 2nd and 3rd nodes, 1 and 2 ears per stalk. Husked ears moderately short and medium plump, 6-7 x 1⅝-1¾ inches, nearly cylindrical; rows 12-14. Kernels at milk stage creamy white, plump.

Honey Dew. Refs. 106, 328, 329, 359, 533.

The name Honey Dew, which certainly should be an attractive cognomen for any sweet corn, has been vested upon two separate introductions. Its first appearance was in 1893 when John Lewis Childs of Floral Park, New York, offered Childs' Honey Dew. This was listed in Childs' catalogs from 1893 to 1922 and during this period the seed supply was grown by Comstock, Ferre & Co., under supervision of Mr. Willard. So far as we know there is no published description of the variety, but the foll wing is taken from recent correspondence: "The variety was white, somewhat resembling Champion Sugar, with ears possibly an inch or two longer and a little more pointed. Stalks grew at least six to seven feet tall." Henry F. Michell & Co., Philadelphia, offered Honey Dew in 1906 which was possibly the same as that offered by Childs.

The second introduction of Honey Dew (Refs. 241, 277, 348, 505, 513, 514. Syn. Chinese Early.) was in 1930 by Stumpp & Walter Co., New York City. This variety originated with L. J. Muller, gardener for Howard Phipps, Esq., at Westbury, Long Island. Mr. Muller crossed Chinese Midget with Golden Bantam and called the selection from this cross Honey Dew.

It was also sold in 1928 by William M. Hunt & Co. of New York as Chinese Early. Because of the unusual sweetness of this sweet corn it is rather difficult to get seed, for the birds are attracted to it and destroy the ears. The comparison and description to follow have reference to the present day variety.

At Geneva 78 days were required to produce edible ears. This was in season with Midget, nearly 2 weeks earlier than Lyman's Pride, and 3 days later than Early June. The plants are 1½ to 2 feet taller than those of Midget, very much less inclined to tiller, have slightly longer leaves and tassels, and have slightly less red coloring on the various plant parts. The ears are borne higher on the stalk and when husked are 1½ to 2 inches longer and slightly less slender. The variety should be considered in the novelty class from the standpoint of yield, appearance, and amount of stover produced. Although small of ear, its tenderness and sweetness is not to be denied. To those home gardeners who seek variety in sweet corn, this colorful sort will be a noticeable addition.

Plant moderately short, 4-4½ feet; stalks slender, straight to very slightly zigzag; nodes 7-8, covered, not prominent; internodes dark green, heavily streaked to solid red at the base of the nodes and on exposed surfaces. Brace roots absent. Tillers moderately many, slightly shorter than central stalk. Leaves short and narrow, 20-22 x 2½-3¼ inches, colored red on the margin with midrib pale red to pink; sheath equal to and longer than internode. Tassel short and medium heavy, 12-14 inches, streaked with dark red at the base; terminal spike erect; lateral spikelets nearly erect, many present, medium long, crowded; bracts very dark green, heavily striped with dark maroon red, ringed at the base with dark red; anthers yellow (pinard yellow), uniform; 56-58 days to anthesis.

Ears borne at 3rd and 4th nodes, one and occasionally two ears per stalk. Shank short and slender, 1½-2 inches. Husk leaves medium in number, short and light. Husks few, short and moderately tightly wrapped. Silk very scanty, rather short and easily removed, uniformly pale greenish yellow in color. Husked ear moderately short and slender, 5-6 x 1¼-1⅝ inches, moderately tapering, partly cylindrical; base slightly enlarged and compressed; tip conical and exposed; rows 8, moderately straight, or slightly irregular at the middle, moderately crowded around the cob.

Kernels at milk stage white, small, shallow and moderately thin; at dry stage dull amber white, small, .9 x .97 x .34 cm. (140 seeds per oz.); distinctly triangular in shape; crown slightly rounded; surface quite finely and abundantly wrinkled; set tightly on cob.

Howling Mob. Refs. 3, 26, 47, 80, 124, 211, 335, 344, 403, 463, 478, 480, 525, 546. Syns. Early Butternut, Early Butternut Sugar, Early Howling Mob, "Everbearing," Silver Beauty.

This name is neither descriptive of the plant nor of the ear of this variety, but is rather the impression of his customers which was left with the originator, C. D. Keller of Toledo, Ohio, after a trip to market. The name is peculiar and apt for according to the story of Mr. Keller, as soon as his wagon was parked in the market stall it would be surrounded by buyers making a loud and clamorous demand for the ears.

Mr. Keller sent a small package of seed of his new variety to W. Atlee Burpee in 1903. This sample did so well in the Fordhook trial grounds that arrangements were made with Mr. Keller to grow a crop of seed for

Burpee in 1904. It was introduced as Howling Mob in 1905 and sold as a novelty.

Eighty-eight days were required for this variety to produce edible ears at Geneva. This was 4 days later than Kendel's Early Giant, about the same season as Crosby, and 6 days earlier than Delicious. The plants are slightly taller than those of Kendel's Early Giant, are heavier, and have tassels that are slightly longer and more bushy. The ears possess husks that are longer and more tightly wrapped, while the husked ears are 1 to 2 inches longer, much more tapering and thicker at the base. Howling Mob has been used extensively by market gardeners throughout the East and Middle West. For a midseason white variety, there is none more popular.

Plant moderately tall, 6-7 feet; stalks moderately heavy and straight; nodes 10-12, exposed and somewhat prominent; internodes heavily streaked with dark red on exposed surfaces. Brace roots present and complete on one node. Tillers moderately many, slightly shorter than central stalk. Leaves moderately long and medium broad, 32-34 x 3½-4 inches; sheath shorter than internode. Tassel moderately long and medium heavy, 18-20 inches; terminal spike erect; lateral spikelets moderately erect, medium long, many present and crowded; bracts and anthers variable in color; 64-65 days to anthesis.

Ears borne at 5th and 6th nodes, often two per stalk. Shank moderately long, 4-8 inches. Husk leaves many, long and heavy. Husks decidedly many, moderately heavy, medium long and rather tightly wrapped. Husked ear moderately long and moderately plump, 8-9 x 1¾-2 inches, slightly tapering; base slightly enlarged and compressed; tip conical and exposed; rows 12-16, usually regular and straight, somewhat irregular at the base.

Kernels at milk stage white, rather narrow and shallow; at dry stage dull white, medium size; medium width and length but quite thick, .96 x .88 x .40 cm. (132 seeds per oz.); roughly triangular in shape; crown slightly rounded; surface slightly rough and rather finely wrinkled, portions almost pebbled; set moderately tight on cob.

Improved Giant. Refs. 193, 353, 518, 522, 533.

Syns. Early Giant, Giant, Improved Early Giant, Maule's Improved Giant.

Wm. Henry Maule introduced this variety in 1901 as one of the largest sweet corn sorts. It originated with "one of the most successful market gardeners in the Northwest," but no information is available as to its exact progenitor.

At the time of the introduction, Improved Giant apparently lacked the height that present stocks possess, since reports indicate "the plants to be comparatively short, but so thick and strong, they will stand up against storms and rains."

Edible ears were produced at Geneva in 94 days, which was 10 days later than Kendel's Early Giant, about in season with Early Evergreen, and 5 days earlier than Long Island Beauty. The plants were much heavier and taller than those of Kendel's Early Giant, more like those of Favorite, Long Island Beauty, and Late Mammoth.

Plant tall, 8-8½ feet; nodes 12-14, slightly exposed; tassels long, coarse and heavy, 20-22 inches. Ears are borne on the 4th to 5th nodes, one and two ears with an occasional nubbin present. Husked ears long and moderately plump, 9-10 x 1¾-2 inches, very slightly tapering; tip abruptly conical, often capped; rows 14-16, straight and regular; kernels at milk stage white;

at dry stage opalescent white, longer than wide, rather thick, 1.1 x .90 x .41 cm., triangular in shape; abundantly wrinkled.

Independence. Refs. 142, 345, 469, 481, 533. Syns.

Fourth of July, Market Gardeners Extra Early.

John A. Salzer Seed Co., La Crosse, Wisconsin, first offered this variety in 1905 and it has proved to be well adapted to growing conditions as found in the Mississippi valley. The seed came originally from Connecticut. Stocks as grown at Geneva have not been uniform in type.

Eighty-two days were required for this variety to produce edible ears. This was 2 weeks earlier than Best of All, 6 days earlier than White Cory, and 2 days later than Mammoth White Cory. The plants are the same height as those of Best of All, less inclined to tiller, and have tassels that are longer and decidedly more slender and feathery. The husked ears are somewhat shorter than those of Best of All and equal to those of White Cory. This is another of the second early, slender, 8-rowed varieties. It is not widely grown and its acquaintance is limited. As with most white varieties, the decline in popularity of the type has been responsible for its present position, although previously this slender and attractive ear would have much in its favor.

Plant moderately tall, 5½-6½ feet; stalks moderately slender and slightly zigzag; nodes 8-9, exposed, prominent; internodes streaked with red on exposed portions. Brace roots present, very slender and not useful. Tillers few, much shorter than central stalk. Leaves medium long and medium broad, 30-32 x 3½-3¾ inches, occasionally colored on the margin; sheath shorter than internode. Tassel moderately long, very slender and feathery, 18-20 inches; terminal spike drooping; lateral spikelets distinctly drooping, many, moderately long, somewhat multi-branched, crowded; bracts pale green, rather heavily striped with light red; anthers mostly pale reddish brown (terra cotta); 58-60 days to anthesis.

Ears borne on 3rd and 4th nodes, often two ears per stalk, one usually a nubbin. Shank extremely variable, usually 6-9 inches long, slender and brittle. Husks moderately few, long and rather tightly wrapped. Silk rather scanty, long and uniformly pale green in color. Husked ear medium long and slender, 7-8 x 1¾-1½ inches, partly cylindrical and very slightly tapering; base slightly enlarged and occasionally open; tip long, conical and exposed; rows 8, straight, occasionally somewhat irregular at the base, conveniently spaced around the cob.

Kernels at milk stage white, moderately narrow and shallow; at dry stage dull white, small, short, slightly wider than long, .8 x 1.0 x .40 cm. (132 seeds per oz.); short, broad oval in shape; crown distinctly rounded; surface moderately but shallowly wrinkled; set tightly on cob.

Indiana Wonder. Refs. 156, 515, 533. Syn. Early Indiana.

In 1899, Mr. James A. Everitt of Indianapolis, Indiana, introduced this variety which originated in the state of his residence. He took a keen pleasure in popularizing improvements in farm crops and spent a great deal of money advertising newer and better varieties. Indiana Wonder, although never attaining widespread attention, was reputed to have had much in its favor. Reports indicate that the variety was a strong and rapid grower, producing two and three ears to the plant, which were nearly twice as large as Adams Early, deep kerneled, and abundantly wrinkled when dry.

Kendel's Early Giant. Refs. 16, 132, 238, 241, 328, 329, 345, 403, 499, 515, 525, 533, 546. Syns. Early Giant, Early Giant Sweet, "Giant," Kendel's Giant, Kendel's New Early Giant, Kendel's New Large Early Giant, New Early Giant.

This large second early variety was introduced in 1896 by A. C. Kendel of Cleveland, Ohio. The original stock was reported to have had larger ears, 8 to 10 inches long, and possessing 10 to 18 rows of kernels. Present day stocks, however, are somewhat shorter and more uniformly 12-rowed.

Eighty-four days were required for edible ears to be produced at Geneva. This was 4 days earlier than Howling Mob, in season with Early Minnesota, and 4 days later than Whipple's Early. The plants are slightly shorter than those of Howling Mob, more slender, and have tassels slightly shorter and more scraggly in habit. The ears have husks that are shorter and more loosely wrapped, while the husked ears are 1 to 2 inches shorter and much more cylindrical. It is used primarily as a home and market garden sort, and for the past 35 years or more has enjoyed widespread popularity.

Plant moderately tall, 6-6½ feet; stalks moderately slender and straight; nodes 8-10, slightly exposed, occasionally prominent, streaked with red at the base. Brace roots present but rather slender and not very useful. Tillers many, slightly shorter than central stalk. Leaves medium long and narrow, 30-32 x 2¾-3¼ inches, very often colored on the margin; sheath equal to and occasionally shorter than internode. Tassel medium long and slender, 17-18 inches, slightly streaked with red at the base; terminal spike erect; lateral spikelets moderately drooping, medium in number and length, not crowded; bracts and anthers somewhat variable in color; 64-68 days to anthesis.

Ears borne at 4th and 5th nodes, one and occasionally two ears per stalk, one usually a nubbin. Shank medium length and heavy, 3-5 inches. Husks moderately few, short and loosely wrapped. Husked ear medium long and moderately plump, 7-8 x 1¾-2 inches, slightly tapering; base somewhat enlarged and expanded; tip conical and exposed; rows 12, straight, regular and moderately crowded around the cob.

Kernels at milk stage white, medium size, rather broad and very thick; at dry stage slightly wider than long, 1.1 x .9 x .4 cm. (116 seeds per oz.); roughly triangular in shape; crown rounded; surface abundantly wrinkled both on the crown and the sides; set moderately tight on cob.

Lackey's Early. Refs. 207, 208, 219, 238, 240, 328, 329, 511, 515. Syns. Lackey, Lackey's Early Sweet, Lackey's New Early.

Credit for the origin of this variety is given by Gregory to a Mr. Lackey of Marblehead, Massachusetts, who developed it as a selection out of Marblehead. In 1890 it was introduced by J. J. H. Gregory as a variety. Although admittedly not as early as Cory or Marblehead, it was superior to either of them in its apparent resistance to smut and its decided increase in sweetness. Reports indicate that the variety produced plants about 5½ feet tall, with ears 7 inches long, containing 8 rows of rather large, closely fitting kernels. No trace of red was evident. It was not widely cataloged; although Gregory carried it continuously up to 1915.

Landreth Sugar. Refs. 22, 89, 91, 93, 126, 313, 350, 397, 404, 411, 433, 507, 508, 511, 513, 514, 532, 533, 537. Syns. Landreth, Landret, Late.

Sturtevant gives the date of introduction in 1884 and since earlier records of the introducers, D. Landreth and Sons of Bristol, Pennsylvania, were destroyed by fire, no more accurate information is available. Since Tracy lists it as a synonym of Old Colony, it is probable that the selection originated from that source. Although apparently never cataloged by other organizations, it has been featured by the introducers continuously from its introduction. As such it is one of the very few old varieties that continue to exist among modern sorts.

At Geneva edible ears were produced in 100 days, which proved to be 2 days later than Stowell's Evergreen, in season with Mammoth Sugar, and 3 days earlier than Cincinnati Market. It should be mentioned, however, that stocks which were available during Sturtevant's time were about 10 days earlier than modern data indicate. The plant much resembled Stowell's Evergreen, being of equal height and vigor, and producing ears of equal length with 16 to 18 rows of kernels. The kernels, however, were more narrow and lacked the converging crown so prominent in the latter.

Plant moderately tall, 6-7 feet; stalks heavy, foliage abundant, dark green; tillers many; tassels rather short, heavy and stiff. Ears borne 28-36 inches from the ground; husk leaves many, medium length. Husk ear moderately long and plump, 8-9 x 2-2¼ inches, moderately tapering; tip abruptly conical to rounded, well filled; rows 16-18, moderately straight, occasionally somewhat spiral, crowded around the cob. Kernels at milk stage white, medium size, moderately deep and narrow; at dry stage whitish amber, rather small, much longer than wide (150 seeds per oz.); triangular in shape; crown slightly rounded; surface moderately wrinkled; set loosely on cob.

Leet's Early. Refs. 22, 90, 91, 96, 121, 170, 411, 510, 511, 512, 513, 514, 535, 536, 538. Syn. Leets.

D. M. Ferry listed this sort for the first time in 1888 as a sweet corn that was given first premium at the Corn Show in Chicago in 1887 as the best early sweet corn. No information is available regarding its origin, although the reference made in early accounts to the presence of red foliage and an occasional red cob would indicate its origin to have been partially from the type represented by Narragansett.

Plant 5 to 6 feet tall, stout with rather short internodes, a little taller than Early Minnesota and often red. The ears were borne 18-24 inches from the ground, very dull white, nearly cylindrical and abruptly conical at the tip, medium long and medium slender, 6-8 x 1½-1¾ inches; rows 8-12, somewhat irregular, pairs not distinct except in 8-rowed ears; kernels at dry stage fairly large and thick; crown rounded, rather coarse appearing; set on either white or red cob.

Long Island Beauty. Refs. 62, 113, 386, 478, 525. Illus. 42.

This is a variety which for many years has been grown as a late variety by Long Island farmers for the New York City market. Its popularity there led to its introduction on the Philadelphia market and in the South. The variety was first offered in 1903 by S. D. Woodruff & Sons, Orange, Connecticut. It is alleged

to be a cross between Late Mammoth and Stowell's Evergreen.

Ninety-nine days were required for Long Island Beauty to produce edible ears at Geneva. This was in season with Oregon Evergreen, 2 days later than Stowell's Evergreen and Squantum, and 4 days earlier than Cincinnati Market. The plants are equal in height and vigor to those of Mammoth Sugar, have a longer but less coarse appearing tassel, and the anthers are consistently more uniform in color. The ears are borne higher on the stalks and attached to longer shanks. The husked ears are of equal length but slightly more plump and less tapering.

Plant tall, 7-8 feet; stalks moderately heavy, straight; nodes 12-14, covered, not prominent. Brace roots present, heavy, whorl complete on one node, useful. Tillers few, slightly shorter than central stalk. Leaves very long and medium broad, 36-40 x 3½-4 inches; sheath longer than internode. Tassel long, rather heavy and coarse, 20-22 inches; terminal spike somewhat drooping, lateral spikelets slightly drooping, many present, moderately long and crowded; bracts green, sparsely striped with pale red; anthers light to buff yellow (pinard yellow to deep colonial buff); 74-76 days to anthesis.

Ears borne at 6th and 7th nodes, one and occasionally two ears per stalk. Shank long, very heavy and tough, 5-6 inches. Husk leaves many, moderately long and heavy. Husks many, rather long, somewhat loosely wrapped and rather easily removed. Husked ear long and plump, 9-10 x 2⅜-2½ inches; moderately tapering; base slightly enlarged and compressed; tip conical and slightly exposed; rows 14-16, regular, moderately straight, crowded around cob.

Kernels at milk stage white, fairly broad, closely set and moderately deep; at dry stage dull white; moderately large, long, medium width and thin, 1.15 x .87 x .38 cm. (104 seeds per oz.); triangular in shape; crown slightly rounded; surface often abundantly and finely wrinkled; set moderately loose.

Lyman's Pride. Ref. 250. Syn. Stay Green.

Correspondence with the Charles C. Hart Seed Company of Wethersfield, Connecticut, indicates this variety to be of unknown parentage, originating with a private gardener, Mr. D. A. Lyman of Columbus, Connecticut, who had grown it for a number of years. It was introduced by Hart in 1927 as a high-quality midseason variety.

At Geneva 91 days were required for this variety to produce edible ears. This was 7 days later than Early Minnesota, 3 days later than Howling Mob, and 3 days earlier than Nectar. The plants are about the same height as those of Early Minnesota, but decidedly more heavily and uniformly shaded with red at the base of the nodes, on the margins of the leaves, and more consistently red-streaked on the sheaths. The tassels are similar in height, but those of Lyman's Pride have laterals decidedly drooping and much more heavily striped with red on the bracts. The tassel and foliage coloring more closely resembles that of Midget and Honey Dew. The husked ears are very similar in shape and size to those of Early Minnesota with the dry kernels in both instances broader than long. The variety is little known in other than certain localized areas, such as Eastern Connecticut where it has been reported to be very popular. Its chief value is said to be due to its ability to stay tender and milky "often remaining

as tender 10 days after ripening as it was when just ready to eat."

Plant moderately short, 4½-5 feet; stalks straight and slender; nodes 8-9, covered, not prominent, shaded with red at the base. Brace roots absent. Tillers moderately many, somewhat shorter than central stalk. Leaves medium long and moderately narrow, 30-32 x 2¾-3½ inches, uniformly red along the margin; sheath longer than internode, moderately striped with dark red on the outer surface. Tassel moderately long and slender, 18-20 inches, very slow in spreading, streaked with dark red at the base; terminal spike drooping; lateral spikelets moderately drooping, moderately many, long and rather crowded, usually branched at the base; bracts dark green, very heavily striped with dark red, often entirely red; anthers uniformly reddish bronze (terra cotta), 70-72 days to anthesis.

Ears borne at 3rd and 4th nodes, one and occasionally two ears per stalk, one usually a nubbin. Shank variable in length, slender and brittle. Husk leaves few and usually short. Husks moderately few, rather heavy, long, tightly wrapped but easily removed; exposed portions heavily streaked with red. Husked ear medium long and moderately slender, 7-8 x 1⅜-1½ inches, nearly cylindrical, slightly tapering; occasionally base somewhat open; tip conical and slightly exposed; rows 8, occasionally 10, moderately paired, straight, occasionally irregular at the base, not crowded around the cob; furrows deep and very narrow.

Kernels at milk stage white, medium size, very short and moderately thick; at dry stage dull white, much broader than long, 1.03 x 1.29 x .44 cm. (76 seeds per oz.); short broad oval in shape; crown rounded; surface abundantly and rather finely wrinkled; set moderately tight on cob.

Malakhoff. Refs. 190, 237, 238, 241, 335, 462, 465, 518, 533. Syns. Amber Malakhoff, Early Malakhoff, White Malakhoff.

The varieties of sweet corn unlike those of most other food crops known and cultivated as vegetables have almost without exception arisen without recourse to any sorts or forms not native to this continent. Malakhoff is the single exception as far as the information at hand indicates.

Seed of this variety was distributed by the United States Department of Agriculture in the spring of 1898. Prof. N. E. Hansen of South Dakota State College made a trip to Russia as agricultural explorer and his recollection of this corn is contained in correspondence of recent date, as follows: "The Malakhoff sweet corn, as I remember it, was secured from Immer & Son Seed Company at Moscow, Russia, in my 1897-8 tour. It dates from southern Russia but that is as far as I can trace it." There are two introductions from Russia on record at the Foreign Plant Introduction Office in Washington, as follows: S. P. I. No. 13 *Zea Mays*. From Moscow, Russia. Received through Prof. N. E. Hansen, Feb. 1898 (6 packages). Earliest sweet corn from Malachows. F. P. I. No. 2799 from Russia (gov't of Tula) under the name Malakhoff through M. A. Carleton. A wax model of an ear of Malakhoff was shown in the exhibit of the United States Department of Agriculture at the Universal Exposition at St. Louis in 1904 as the "earliest sweet corn."

After trial in this country it appeared that in Russia this variety had been selected for earliness rather than uniformity of color, the color of the mature kernel varying from white to pale yellow or amber. It was the intention to breed this variety true for color, but as

seedsmen began to introduce it, it was put on the market to establish priority and called Malakhoff which name suggests a place in the Crimean peninsula.

Malakhoff was first offered by Vaughan's Seed Store and by James J. H. Gregory & Sons in 1906. For many years it was considered a good "first early" and as one writer said "perhaps a little too small for the market, yet we shall do wisely to welcome the Russian stranger into our home gardens." It has been used in the development of new varieties, particularly in Canada. Present stocks seem to be quite different from the original 8-rowed sort. Present-day Malakhoff is listed by the House of Gurney, Inc., Yankton, South Dakota.

Little reliable information is at hand regarding the exact season. Originally this variety was a very early and prolific bearer, and as near as can be told, was as described below. Present stocks produce ears with 10 to 12 rows but the original Malakhoff described below was an 8-rowed sort. As it exists it has little value even as a home garden variety, although an occasional selection has been brought to the attention of the authors that appears to be very uniform and attractive.

Plant short, $3\frac{1}{2}$ -4 feet; stalks straight and very slender; nodes 6-7, covered, not prominent, slightly streaked with red at the base. Brace roots absent. Tillers few to none, slightly shorter than central stalk, occasionally bearing one good ear. Leaves short and narrow, 20-22 x $2\frac{1}{2}$ -3 inches; sheath equal to and often longer than internode. Tassel short and slender, 12-15 inches; terminal spike erect; lateral spikelets horizontal to moderately erect, moderately short, few present but crowded, simple; bracts variable in color; anthers usually buff (deep colonial buff), few reddish bronze (terra cotta); 63-64 days to anthesis.

Ears borne at 4th and 5th nodes, one and often two ears per stalk, one usually a nubbin. Shank long and slender, 4-7 inches, brittle. Husk leaves few, short and light. Husks moderately many, medium length, rather loosely wrapped, easily removed. Silk medium in amount, long and pale red. Husked ear short and slender, 5-6 x $1\frac{3}{8}$ - $1\frac{1}{2}$ inches; slightly tapering; base compressed; tip abruptly conical to rounded, slightly exposed; rows 8, straight and regular, occasionally paired in which case the furrows were deep and very narrow.

Kernels at milk stage white, medium width, shallow and moderately thick; at dry stage dull white, slightly broader than long, .93 x 1.04 x .40 cm. (128 seeds per oz.); short oval in shape; crown rounded, surface moderately fine and abundantly wrinkled; set tightly on cob.

Mammoth. Refs. 17, 18, 22, 52, 73, 74, 89, 90, 91, 93, 95, 96, 97, 120, 168, 238, 240, 241, 308, 328, 329, 338, 344, 350, 367, 397, 403, 404, 405, 407, 408, 411, 422, 423, 427, 432, 435, 487, 503, 507, 508, 509, 510, 511, 514, 515, 516, 517, 518, 533, 535, 536, 537, 538. Syns. Burvis Mammoth, Improved Mammoth, Large Late Mammoth, Late Mammoth, Late Sugar Mammoth, Late Sweet Mammoth, Mammoth Sugar, Mammoth Sweet, Marblehead Mammoth, Maule's Mammoth. Illus. 43.

Whether or not plant and ear of this variety as grown today would be identical with plant and ear of the sort listed as Mammoth in 1867 cannot be verified. On the basis of comparing one variety with another the evidence indicates, however, that Mammoth has always represented the largest eared variety of sweet corn to be

found. Gregory in his catalog of 1870 says of Mammoth Sweet, "My Mammoth took the first prize at the annual exhibitions of the Massachusetts Horticultural Society in 1864 and 1867; the ears exhibited weighing as gathered from the stock, between two and three pounds each." Burr's Improved or Twelve-Rowed Sweet (87) was probably the precursor of all of the later appearing Mammoths. It is quite possible that this variety, together with Black Mexican and Stowell's Evergreen, has been listed for a longer time and has had a wider distribution than any other of the varieties of sweet corn. The very size of the ear of Mammoth has been considered a drawback on some markets, but since it takes "all sorts to make a world," there is a place for both the Midget "with three bites to the ear" and the Mammoth "one ear to a meal."

Edible ears were produced at Geneva in 100 days, 2 days later than Stowell's Evergreen and 3 days earlier than Cincinnati Market. The plants are the same height as those of Stowell's Evergreen, slightly heavier and have less tendency to tiller. The ears are borne about the same height on shanks that are slightly shorter, while the husks are somewhat more loosely wrapped and heavier. The husked ears are slightly longer, less plump, and contain 2 to 4 less rows. The kernels in the dry stage are much thicker, somewhat shorter in proportion to the width and lack the converging crown present in Stowell's Evergreen. The variety is used by home gardeners and by market gardeners who supply those city markets which demand the largest possible ears of good quality.

Plant tall, $7\frac{1}{2}$ -8 feet; stalks straight and heavy; nodes 12-14, usually covered, not prominent. Brace roots present, complete, heavy and useful on one node. Tillers few, slightly shorter than central stalk. Leaves moderately long and medium broad, 32-34 x $3\frac{3}{4}$ -4 $\frac{1}{4}$; sheath equal to and longer than internode. Tassel moderately long and heavy, 18-20 inches, very coarse; terminal spike erect; lateral spikelets horizontal to moderately erect, medium long, rather few and scattered; bracts green, sparsely striped with light red; anthers variable in color; 71-73 days to anthesis.

Ears borne at 4th and 5th nodes, one and occasionally two ears per stalk. Shank moderately short and heavy, 3-4 inches. Husks moderately many, medium length, coarse and heavy, rather loosely wrapped. Husked ear long and plump, 9-10 x $2\frac{1}{4}$ - $2\frac{1}{2}$ inches, moderately tapering; base enlarged and compressed; tip conical, slightly exposed and occasionally capped; rows 18-20, moderately straight, slightly irregular at the base, crowded around the cob.

Kernels at milk stage white, medium size, distinctly thick; at dry stage dull white, longer than wide, 1.13 x .95 x .40 cm. (112 seeds per oz.); triangular in shape; crown rounded, surface with moderately fine, rather abundant wrinkles, set loosely on cob.

Mammoth White Cory. Refs. 11, 33, 67, 240, 241, 297, 345, 348, 405, 516, 517, 518. Syns. Early Mammoth White Cory, Lakeview Early Market, Mammoth Cory, Mammoth White Cob Cory, New Mammoth White Cory, Selected Mammoth Early Cory. Illus. 48.

This, the survivor of the Cory group, was introduced by D. M. Ferry & Co. of Detroit in 1897. To it the cognomen "King of the Market" was applied by Gregory as indicative of its popularity with the consumers. Because of changing market preferences at



MAMMOTH WHITE CORY

(Four-fifths natural size)



MIDGET

(Natural size)

that time the small, early, 8-rowed varieties had begun to lose popularity. No longer was earliness the single primary factor of importance in establishing a variety, for size of ear was given major consideration.

At Geneva 80 days were required for Mammoth White Cory to come into production. This proved to be 8 days earlier than White Cory, in season with Whipple's Early, and 5 days later than Early Mayflower. Plants are 1 to 1½ feet shorter than those of White Cory, more slender, with shorter internodes, less tendency to tiller, and with shorter, more coarse-appearing tassels. The ears are equal in length, contain 4 more rows, and are more plump. It has very largely replaced White Cory as a market and home garden variety and as such has proved very popular. Its comparative earliness coupled with its large yield has made it a favorite with many growers.

Plant moderately short, 4½–5 feet; stalks slender and usually straight; nodes 9–10, usually covered, occasionally somewhat prominent; internodes slightly streaked with red on the exposed portions. Brace roots usually present on one node. Tillers moderately few present. Leaves medium long and narrow, 28–30 x 2¾–3 inches; sheath equal to and occasionally shorter than internode. Tassel medium length and moderately heavy, 15–18 inches; terminal spike erect; lateral spikelets erect, moderately many, rather scattered and short; bracts green, rather heavily striped with red; anthers bronze red (terra cotta to vinaceous red); 55–60 days to anthesis.

Ears borne at 4th and 5th nodes, one ear per stalk with an additional nubbin present. Shank medium long, 4–5 inches, slender and brittle. Husks many and rather heavy, loosely wrapped, easily removed. Husked ear medium long and medium plump, 6–8 x 1¾–17⁄8 inches, slightly tapering and partly cylindrical; rows 10–12, regular, occasionally somewhat curved and irregular at the base.

Kernels at milk stage white, moderately wide, thick and rather shallow; at dry stage, dull amber white, medium size and width, moderately short and thick, 1.0 x 1.07 x .39 cm. (128 seeds per oz.); almost square, occasionally somewhat triangular; crown slightly rounded; surface moderately rough and coarsely wrinkled; set tightly on cob.

Marblehead. Refs. 61, 73, 74, 89, 91, 93, 168, 214, 217, 236, 327, 328, 350, 397, 407, 408, 411, 412, 425, 429, 441, 503, 507, 508, 509, 510, 511, 512, 532, 533, 535, 536, 537, 538, 545. Syns. Early Marblehead, Early Red Marblehead, Extra Early Marblehead, Marblehead Sugar, New "Cory."

A selection from Early Narragansett, J. J. H. Gregory of Marblehead, Massachusetts, sent this out about 1880 as Marblehead Early, "the earliest variety of sweet corn cultivated." Descriptions and early advertisements testify to the similarity of this and Narragansett except for a few days difference in edible maturity. For 20 years this variety was widely grown and generally accepted as one of the earliest white sweet corns known.

Plant moderately short, 4½–5 feet; stalks rather stout. Tillers many, rather short, usually one-half as tall as central stalk. Foliage more or less tinged with purple. Tassel short, stiff. Ears borne low, 12–18 inches from the ground. Dry ears 6–7 x 1¾–1½ inches, slightly tapering; base slightly enlarged; rows 8, straight, usually paired. Kernels at dry stage red tinged to reddish flesh color, large, broader than deep; crown rounded; surface slightly wrinkled, often nearly smooth; set tightly on red cob.

Maule's XX. Refs. 22, 91, 126, 238, 241, 350, 368, 403, 411, 510, 515, 533, 537, 538. Syn. Maule.

Wm. Henry Maule introduced this variety in 1888, although it was never featured by that organization until 1901. The introducer paints a glowing picture of the stock after which he says concerning its origin, "I first offered the corn to the public in 1888, and for 20 years before that time it had been the favorite sweet corn of the late Mr. Alfred Rose of Penn Yan, New York, one of the most successful market gardeners in the United States . . ." The variety has been listed continually, although present-day stocks are considerably later in season than reports of the original stocks would indicate.

Old accounts indicate that the plants were about 4½ to 5 feet tall, producing ears 7 to 8 inches long that contained 12 to 14 rows and reached edible maturity in about 80 days. At Geneva, however, the plants averaged about 1 foot taller and the ears 1 inch longer, reaching edible maturity in about 90 days.

Mayflower. Refs. 21, 32, 230, 335, 525, 546. Syns.

Earliest Mayflower, Early Mayflower, Extra Early Mayflower, Mayflower No. 2.

This variety was developed and later introduced in 1912 by the Everett B. Clark Seed Co. of Milford, Connecticut. It was an early selection from Mammoth White Cory and was very popular for several years among New England growers. Allen, Sterling, and Lathrop, Portland, Maine, listed it in their catalog of 1913 as an early variety that had commanded the utmost praise from all who had tried it. It was also listed by Becketts Seed Store in 1913 and shortly after by most eastern houses. It was largely used to replace Perry's Hybrid and was widely recommended by various Connecticut seed corn growers. After about 15 years of popularity another selection, Early Surprise, largely took the place of Mayflower in sweet corn lists.

At Geneva Early Mayflower came into production in 75 days, 5 days earlier than Mammoth White Cory, in season with Alpha, and 5 days later than Early Market. The plants are as tall as those of Mammoth White Cory, slightly heavier and more zigzag, whereas the ears are much alike with the tips more consistently abruptly tapered. Its earliness seems to be the most outstanding characteristic in comparison to Mammoth White Cory and responsible for its use as a home and market garden variety.

Plant moderately short, 4½–5 feet; stalks moderately slender and zigzag; nodes 7–8, prominent, exposed. Brace roots absent. Tillers few, slightly shorter than central stalk. Leaves moderately short and moderately narrow, 26–28 x 3–3½ inches; sheath shorter than internode. Tassel medium long and slender, 15–18 inches; terminal spike erect; lateral spikelets moderately erect, few, short and scattered; bracts green, sparsely striped with red, occasionally ringed at the base; anthers reddish bronze (terra cotta to vinaceous russet); 56–58 days to anthesis.

Ears borne at 4th and 5th nodes, one and occasionally two ears per stalk, one usually a nubbin. Husk leaves moderately many, long and heavy. Husks medium in number, thick, short, and rather loosely wrapped. Husked ear medium long and moderately slender, 6–8 x 1½–1⅝ inches; slightly tapering, partly

cylindrical; rows 10-12, usually straight, occasionally somewhat irregular at base; crowded around cob; tip abruptly conical.

Kernels at milk stage white, medium size, shallow; at dry stage dull white, slightly broader than long, rather thick, 1.0 x 1.1 x .42 cm. (100 seeds per oz.); nearly square; crown somewhat rough; surface sparsely and coarsely wrinkled, often deeply ridged; set tightly on cob.

Melrose. Refs. 74, 207, 208, 405, 450, 452, 454, 503, 515, 517, 518, 533. Syn. New Melrose.

One of the earliest records of Melrose occurs in the 1895 catalog of J. M. Thorburn and Company. It was listed by several other organizations and as far as can be determined was listed by Thorburn until 1912 and by Tait until 1918.

Little definite information is available concerning the description of plant or ear. The editor's report of the *Rural New-Yorker* for 1897 is perhaps the most enlightening article regarding this sort. In this article Melrose is reported to have produced plants about the same height as the first earliest (at that time Cory, etc.), producing 2 ears per stalk which averaged 9 inches in length, possessing 12 rows. The kernels were medium size and were of better quality than any of the other first earlies. He concluded his article by saying, "It is the best sort of just its season, that we have tried."

Metropolitan. Refs. 71, 139, 238, 241, 257, 329, 335, 345, 403, 517, 518, 525, 533. Syns. Early Metropolitan, Improved Metropolitan.

This old sort introduced by Peter Henderson in 1898 was seemingly well thought of during the succeeding 10 years. The original strain came from a Mr. Browning of Lake Waccabuck, New York. There were three serious defects to which early varieties of corn were susceptible, viz., weakness of plant, inferior flavor, and susceptibility to a fungus growth known as smut. In surmounting these defects Metropolitan outclassed its contemporary varieties and has continued as a great favorite on the market.

At Geneva 92 days were required before Metropolitan came into production, which proved to be 4 days earlier than Henderson, 6 days earlier than Stowell's Evergreen, and 4 days later than Howling Mob. The plants are 1½ feet shorter than Henderson, have a greater tendency to tiller, and are less streaked with red on the tassels. The husked ears are shorter, not as plump, and have 2 to 4 less rows of kernels. In the dry stage the kernels are not as long in proportion to the breadth as those of Henderson, but otherwise are much alike.

Plant moderately tall, 6½-7 feet; stalks straight, medium heavy; nodes 10-12, usually covered, not very prominent. Brace roots present, rather heavy, whorl complete on one node, useful. Tillers moderately many, about ¾ shorter than central stalk. Leaves long and medium broad, 34-36 x 3½-4 inches, rather heavy and coarse; terminal spike erect; lateral spikelets moderately erect to horizontal; medium long, moderately many and crowded; bracts variable, although usually dark green, striped with a lighter shade; anthers buff (chamois); 74-76 days to anthesis.

Ears borne at 4th and 5th nodes, one ear per stalk with an additional nubbin present. Shank variable, rather heavy. Husk leaves few, rather long and narrow, light. Husks many, heavy, moderately long, tightly wrapped and difficult to remove. Husked

ear moderately long and moderately plump, 8-9 x 1¾-2 inches, slightly tapering; base slightly enlarged and compressed; tip rather abruptly conical and slightly exposed; rows 10-12, straight, regular, crowded around the cob.

Kernels at milk stage white, small, medium width and shallow; at dry stage short, thick and narrow, .96 x 1.1 x .43 cm. (120 seeds per oz.); nearly square; crown moderately rounded; surface abundantly but rather shallowly wrinkled; set moderately tight on cob.

Mexican Wonder. Refs. 345, 492. Syn. New Mexican Wonder.

This variety was a chance hybrid, involving Black Mexican and an unknown white, developed by A. L. Mogle of Wilkinson, Indiana. Stark Brothers of Louisiana, Missouri, who introduced the variety about 1929 mention the fact that the variety was grown by the originator in its mixed condition for 15 years before it was listed by them. The mixture, consisting of both white and bluish-black kernels, continued to be present to 1931 when the variety was discontinued. It was handicapped, of course, by the appearance of the dark kernels when left too long before using, and although of good quality, in this respect was accorded the same reaction reiterated in the discussion of Black Mexican and Pickaninny.

Eighty-two days were required to produce edible ears, which proved to be 4 days earlier than Black Mexican. The plants were slightly shorter and more bushy in appearance, due to shorter internodes and the consequent greater number of leaves, as well as the presence of numerous husk leaves. The husked ears differ from those of Black Mexican in possessing more rounded tips, often more rows, narrower kernels, and larger cobs.

Midget. Refs. 58, 348, 504. Syns. Bantam Crosby, Chinese Midget. Illus. 25, 49.

This is the only miniature sweet corn in all the long list of varieties. It has been in use on private estates for many years where it was generally known as Midget and only recently has it been listed in catalogs. Joseph Breck & Sons of Boston call it Bantam Crosby and have so carried it since 1923. Stumpp & Walter first listed it as Midget in 1924. We have been unable to trace the origin of this variety and our search has followed one trail from estate to estate across Long Island up along the New England Coast to Brookline and Groton, Massachusetts, and across the line into New Hampshire. It has been grown on many of the finest private estates in the country, including "Holmlea" developed by the late Prof. C. S. Sargent of Brookline.

In a few places where it has been grown it has been known as Chinese Midget. This might indicate an Asiatic origin. It is wholly distinct and there is nothing like it among cultivated varieties of sweet corn. The variety New Queen as described in 1889 showed some similar characteristics, but since this variety was soon lost no direct comparison could be made.

Edible ears were produced at Geneva in 78 days, in season with Honey Dew, and 3 days later than Alpha. The plants are 1½ to 2 feet shorter than those of Honey Dew, are more inclined to tiller, and have more red

coloration on the foliage. The ears are 2 to $2\frac{1}{2}$ inches shorter and less tapering. Although of no commercial value, its distinct foliage color and its uniformity in size and shape of plants render it an attractive addition to any home garden. It remains in the edible stage a very short time but when harvested at the correct stage the kernels are exceedingly sweet, tender, and meaty.

Plant very short and bushy, $2\frac{1}{2}$ – $2\frac{3}{4}$ feet; stalks slender and straight; nodes 7–8, not prominent; internodes short, slender and straight, exposed portions shaded solid red over the entire surface. Brace roots absent. Tillers decidedly many present, slightly shorter than the central stalk. Leaves short and narrow, 18–20 x $2\frac{1}{2}$ –3 inches; midrib narrow, deep pink to light red, prominent; sheath equal to and occasionally longer than internode. Tassel very slender and short, 9–10 inches, nearly solid red; terminal spike erect; lateral spikelets nearly erect, many, very short and crowded; bracts dark greenish red, heavily striped with deeper red, ringed with red at the base; anthers yellow (pinard yellow), very uniform; 55–56 days to anthesis; period between tassel emergence and pollen shed fully a week, much longer than with most varieties.

Ears borne at 2nd, 3rd and 4th nodes, two and occasionally three ears per stalk, with additional nubbins on tillers. Shank short and slender, $1\frac{1}{2}$ –2 inches; husk leaves few, short and distinctly descending. Husks few, thin, short, tightly wrapped but easily removed, with exposed portions dull red. Silk short, scanty and uniformly greenish yellow in color. Husked ear short and slender, $3\frac{1}{2}$ – $4\frac{1}{2}$ x $1\frac{1}{2}$ – $1\frac{3}{4}$ inches, somewhat cylindrical and slightly tapering; base compressed; tip conical and slightly exposed; rows 8, usually regular and straight except when extreme crowded condition renders them otherwise, crowded around the cob.

Kernels at milk stage white, small, thin and shallow; at dry stage dull white, short, medium breadth and very thin, .89 x .86 x .32 cm. (176 seeds per oz.); somewhat triangular in shape; crown distinctly rounded; surface finely and abundantly wrinkled; set moderately tight on cob.

Mimms' Hybrid. Ref. 245.

This variety was introduced in 1912 by Joseph Harris Co., Coldwater, New York, after they had secured seed from J. W. Mimms, a local farmer. Mr. Mimms selected this corn out of Perry's Hybrid, and since the latter had a red cob and kernel of a red character, it becomes evident that Mimms' Hybrid resulted as a natural cross or mechanical mixture of some sort. The good qualities of Perry's Hybrid, large size, earliness, and productiveness, are reproduced in this corn which the Harris Company has maintained as a sort well suited to central New York.

Ninety days were required for edible ears to be produced at Geneva. This was 2 days earlier than Metropolitan, in season with Quincy Market, and 2 days later than Howling Mob. Plants are about the same size as those of Metropolitan, with tassels slightly longer, much more slender and delicate, with lateral spikelets more drooping. The husked ears are 1 to 2 inches longer, more nearly cylindrical and have 2 to 4 more rows of kernels. Kernels in the dry stage are slightly smaller and are set more tightly on the cob. Mimms' Hybrid is well adapted for the market gardener, the canner, and the home gardener and is used to some extent in this state with considerable success. It is, however, of only localized importance as few seedsmen list it. The ears are very attractive and quite uniform, so that the variety, were it not for the general decline

of interest in all white varieties, has potential possibilities of becoming a leader.

Plant moderately tall, $6\frac{1}{2}$ feet; stalks moderately slender and straight; nodes 10–11, usually covered, not prominent, slightly streaked with red at the base. Brace roots present, useful, whorl complete on one and occasionally two nodes. Tillers many, slightly shorter and occasionally equal to stalk. Leaves medium long and medium broad, 30–32 x $3\frac{1}{2}$ –4 inches; sheath equal to and occasionally shorter than internode. Tassel long and slender, 22–24 inches; terminal spike erect; lateral spikelets slightly drooping, many, long, and crowded; bracts green, sparsely striped with light red; anthers somewhat variable in color; 70–73 days to anthesis.

Ears borne on 4th and 5th nodes, often two ears per stalk. Shank variable in length, 4–8 inches, heavy. Husks short, rather heavy, tightly wrapped and rather difficult to remove. Husked ear long and moderately plump, 9–10 x $1\frac{5}{8}$ –2 inches, slightly tapering and partly cylindrical, attractive; base usually compressed but occasionally somewhat open; tip abruptly conical to nearly rounded, slightly exposed and occasionally capped; rows 12–14, straight, regular, crowded around the cob.

Kernels at milk stage white, medium size, rather narrow; at dry stage opalescent white, slightly wider than long, thick, .92 x .98 x .40 cm. (140 seeds per oz.); nearly square; crown slightly rounded; surface abundantly and rather finely wrinkled; set loosely on cob.

Money Maker. Ref. 316.

The D. Landreth Seed Co., Bristol, Pennsylvania, offered Money Maker for the first time in 1916. Although we find no record of its being listed by any other seed company, it appears to be distinct and to have considerable merit. Landreth described it originally as a variety "with a combination of earliness, size, productiveness, and most unexampled quality of a most exquisite flavor."

Ninety-nine days were required for Money Maker to produce edible ears at Geneva. This was 1 or 2 days later than Stowell's Evergreen, in season with Broad Grained and Oregon Evergreen, and 1 day earlier than Mammoth Sugar. The plants are equal in height to those of Oregon Evergreen, are more inclined to tiller, and have a more bushy tassel with anthers buff colored instead of red. The husked ears are slightly shorter than those of Oregon Evergreen and much more slender and more glistening.

Plant tall, $7\frac{1}{2}$ feet; stalk heavy and straight; nodes 12–14, usually covered, not prominent. Brace roots present and complete on one node, heavy and useful. Tillers decidedly many, equal to and occasionally slightly shorter than central stalk. Leaves moderately long and medium broad, 32–34 x $3\frac{1}{2}$ –4 inches; sheath longer than, but occasionally equal to internode. Tassel moderately long and heavy, 18–20 inches, bushy; terminal spike erect; lateral spikelets nearly horizontal, very many, medium long and crowded; bracts green, rather sparsely striped with red; anthers reddish bronze (terra cotta to vinaceous russet); 77–78 days to anthesis.

Ears borne at 6th to 8th nodes, often two ears per stalk with an additional nubbin present. Shank short and slender, 2–3 inches. Husks moderately many, long and tightly wrapped. Silk rather scanty, short and easily removed. Husked ear moderately long and medium plump, 8–9 x $1\frac{5}{8}$ – $1\frac{7}{8}$ inches, partly cylindrical and very slightly tapering; base compressed; tip conical and slightly exposed; rows 12, straight, regular and attractive, crowded around the cob.

Kernels at milk stage white, glistening, medium size, shallow and rather thick; at dry stage dull white, medium width, slightly longer than wide, 1.1 x 1.3 x .32 cm. (148 seeds per oz.); triangular in shape; crown slightly rounded; surface abundantly and often finely wrinkled; set moderately loose on cob.

Moore's Concord. Refs. 18, 22, 49, 61, 73, 74, 89, 91, 93, 121, 214, 236, 238, 241, 243, 278, 328, 329, 370, 404, 405, 407, 408, 411, 414, 422, 423, 430, 435, 441, 456, 487, 503, 507, 508, 510, 511, 512, 514, 515, 516, 517, 532, 535, 536, 537, 538, 544. Syns. Concord, Early Concord, Early Concord Sugar, Early Moore's Concord, Early Moore's Concord Sweet, Extra Early Concord Sugar, Late Concord, Moore's Early, Moore's Late Concord.

The following is quoted directly from the report of the Committee on Vegetables for 1870, published in *Transactions* of the Massachusetts Horticultural Society for 1867-71:

"To Capt. John B. Moore of Concord, Mass., belongs the honor of originating this fine corn. It is a cross between Crosby's Early and Burr's Improved, two well known sorts; the former the most popular *early*, and the latter considered the best late variety. It was first crossed in 1865 and again in 1867. Stalks strong, stocky and vigorous, from seven to seven and a half feet in height. Ears set rather low on the stalk, and having from twelve to sixteen, usually, and occasionally twenty rows on each ear. Color, when fit for the table, very white and handsome. Quality superior, not surpassed by any other variety, being exceedingly tender and sweet. Size of ears, large, considerably larger than the Early Crosby, and superior to any other either for market or for family use, and very productive. It also matures earlier than any other variety of sweet corn of equal size, which will undoubtedly make it a very desirable sort for the market gardener.

"Mr. Moore exhibited specimens of this Corn from his field planted in the open ground, well filled and in the best possible condition for the table, on the same day (July 23) as the Darling's Early was shown, a small eight-rowed variety heretofore considered the earliest Sweet Corn; the latter variety having the benefit of a start in pots in a frame or greenhouse, before planting out in the open ground. The first exhibition of Crosby's Early was made, July 30, by Josiah Crosby and Daniel Clark, so it will be seen that on the score of *earliness* Moore's Early Sweet Corn takes the lead. It was also shown by Mr. Moore at every subsequent exhibition during the season and at the Annual in September, in fine condition, and attracted more than usual attention.

"Your Committee, deeming it a duty they owe to the public to obtain all the information in their power with regard to every new candidate for public favor, visited the grounds of Mr. Moore, and after going through his fine field, and making a careful examination of the same, would say that they returned more fully convinced than before of its value. The Society's Silver Medal was awarded Mr. Moore by your Committee."

Needless to say, Moore's Concord became a very popular variety and was widely grown until soon after the turn of the century when other prize winners crowded out those older sorts.

Moonarchie. Refs. 184, 241, 386, 483, 533.

I. N. Simon & Son, Philadelphia, gives the place of origin of this variety in a section called Moonarchie, Essex County, New Jersey. The exact date of its introduction is not known, although the earliest data are that recorded by Tracy in 1902. J. F. Noll and Company of Newark, New Jersey, listed it at least since 1908 and continued it throughout the life of the company. The successors, Alexander Forbes and Company, listed it for 1 year, discontinuing it in 1919. It was a late sweet corn, ready for eating about the same time as Stowell's Evergreen. It was reported to be a fine yielder, producing large well-filled ears 9 to 10 inches long with 14 to 16 rows.

Morning Dew. Ref. 543. Syns. Early Morning Dew, Vick's Morning Dew.

This variety was introduced by James Vick's Sons of Rochester, New York, in 1920 as one of the largest extra early white sorts. At the time of its introduction and for a few years later the stock was apparently one that produced plants somewhat smaller than other varieties producing large ears. In recent years, however, our trials at Geneva indicated that present stocks of this variety are so nearly like those of Whipple's Early White that the two are inseparable. This is in agreement with data that show plant height and vigor, ear size and shape, together with time of maturity of the two named varieties to be practically, if not entirely, identical.

Narragansett. Refs. 13, 14, 22, 52, 61, 73, 89, 91, 93, 126, 168, 214, 236, 240, 309, 397, 404, 407, 408, 411, 422, 423, 424, 429, 503, 507, 508, 535, 536, 537, 538, 544. Syns. Early Narragansett, Early Dwarf Narragansett, Early Red Narragansett, Extra Early Narragansett, Extra Early Narragansett Sugar.

Narragansett appeared in the catalogs as a named variety about 1860, a new type of cultivated sweet corn with reddish to red kernels and red cob. Earliness in sweet corn was the chief character sought by seedsmen at that time. This variety was handicapped by several unfavorable characteristics; rather unattractive ears, having a strong tendency to openness between pairs of rows, flat kernels of varying color, and worse yet, when the ears were a trifle old or improperly cooked, the color of the cooked corn was quite dark.

No clue as to its origin has been unearthed, unless a reference to a variety grown by the Mandan Indians with somewhat similar characteristics might indicate a relationship. This variety had seed red brown when hard and dry and a white cob with a red ring about the edge of the pith, but when picked at the roasting stage the kernels were a light amber.

Plant moderately short $4\frac{1}{2}$ -5 feet, stalks slender. Tillers few, hardly half as tall as central stalk. Ears borne low, 16-20 inches from the ground, $6-7\frac{1}{2} \times 1\frac{1}{2}-1\frac{5}{8}$ inches; nearly cylindrical with tip distinctly tapering; rows 8, distinctly paired, regular and straight; furrows deep and often rather broad. Dry kernels light flesh-tinge to dark red, rather large, broader than deep, (103 seeds per oz.); crown rounded; surface wrinkled; set tightly on red cob.



NARROW GRAINED EVERGREEN

(Three-quarters natural size)



NE PLUS ULTRA

(Three-quarters natural size)

Narrow Grained Evergreen. Refs. 89, 91, 93, 124, 316, 318, 344, 367, 368, 535, 536, 562. Syns. Improved Narrow Grain Evergreen, Long Narrow Grained Evergreen, Maine Style Evergreen. Illus. 25, 52.

This sweet corn, developed by the Everett B. Clarke Seed Company, Milford, Connecticut, and introduced in 1904, soon established itself as a splendid high-quality Evergreen. Of all the Evergreen family this stock, which was bred from Stowell's Evergreen, has the narrowest, deepest kernels with nearly twice the number of rows. In some sections it is known as Evergreen, Maine Style, deriving the name because of its use by Maine canners. A very similar or identical stock was worked up by S. F. Leonard at the La Grange, Illinois, farm of the Leonard Seed Company of Chicago. This strain is known today as Leonard's Narrow Grain Evergreen.

Ninety-eight days were required for this variety to reach edible maturity at Geneva. This was in season with Stowell's Evergreen, 4 days later than Improved Giant, and 2 days earlier than Mammoth. Plants are much like those of Stowell's Evergreen, possibly slightly heavier, with less tendency to tiller and with somewhat lighter tassel. The husked ears are the same size, more tapering, and contain 6 to 8 more rows of kernels. Kernels are decidedly more narrow and usually more regular in appearance. In the dry stage they lack the converging crown of Stowell's Evergreen, and as a whole, are more uniformly arranged. The variety is used extensively by the canning industry and has brought much favorable comment because of its uniformity and attractiveness of the fine kernalled ears. Within recent years this has been one of the varieties with which considerable progress has been made in breeding hybrid-inbred strains.

Plant tall, $7\frac{1}{2}$ - $8\frac{1}{2}$ feet; stalks heavy and straight; nodes 12-14, covered, not prominent. Brace roots present on 1st and 2nd nodes, heavy, first whorl complete and useful. Tillers very few, slightly shorter than central stalk. Leaves long and moderately broad, 32-34 x $3\frac{1}{2}$ -4 inches; sheath equal to and longer than internode. Tassel long and very heavy, 20-22 inches; terminal spike erect; lateral spikelets horizontal to slightly drooping, many, long, and rather crowded; bracts green, rather sparsely streaked with red; anthers variable in color; 72-74 days to anthesis.

Ears borne at 6th and 7th nodes, two ears per stalk with an occasional nubbin present. Husks moderately many, heavy, moderately short and loosely wrapped. Silk moderately long and abundant, pale red to amber. Husked ear moderately long and plump, 8-9 x $2\frac{1}{4}$ - $2\frac{1}{2}$ inches, decidedly tapering, base enlarged and compressed; tip conical and exposed; rows 18-24, usually regular, straight, very crowded around the cob.

Kernels at milk stage white; small, very narrow and deep; at dry stage, opalescent white, very narrow, long and thin, 1.41 x .60 x .23 cm. (216 seeds per oz.); long triangular in shape; crown usually straight across; surface rough, usually deeply creased, otherwise very coarsely but deeply wrinkled and pitted; set very loose on cob.

Ne Plus Ultra. Refs. 22, 23, 65, 73, 74, 75, 78, 90, 91, 94, 95, 96, 97, 121, 126, 164, 188, 218, 221, 238, 241, 275, 290, 293, 328, 329, 335, 350, 367, 368, 382, 397, 404, 405, 406, 411, 419, 445, 447, 448, 449, 453, 455, 498, 503, 507, 508, 510, 511, 512,

513, 514, 518, 532, 533, 535, 536, 537, 538, 545. Syns. Banana, Epicure, Hawaii, Improved Ne Plus Ultra, Little Gem, Mammoth Early Epicure, Pure Improved Ne Plus Ultra, Quaker, Quaker Sweet, "Shoe Peg," Zig Zag. Illus. 53.

The original seed of this variety is said to have been grown by a family in New Jersey and held closely by them for many years prior to 1882, at which time Burpee secured part of the stock and named it Ne Plus Ultra. In a catalog issued by Gregory in 1876 a variety called Quaker Sweet Corn was listed under the new or rare vegetables. This variety was described as late, "the sweetest white variety I have yet found. Kernels resemble closely Stowell's Evergreen." The latter listing by Gregory was not repeated until 1890 when he says in connection with Ne Plus Ultra (Quaker Sweet Corn) "Under this latter name I introduced to the public, a number of years ago, a variety of sweet corn, since called 'Ne Plus Ultra' which Latin name translated into English would read 'The unsurpassable corn.'"

The original source of this first "broken row" variety must for the present remain unknown. The writers have been unable to find an Indian corn which might have been the foundation stock. It is most probable that the type resulted as a chance sport or natural cross between two unknown varieties.

Edible ears were produced at Geneva in 95 days, 2 days earlier than Country Gentleman and 8 days earlier than Cincinnati Market. The plants were slightly shorter than those of Country Gentleman, tassels somewhat shorter both in terminal and lateral spikelets. The husked ears were 2 to 3 inches shorter and somewhat more slender, otherwise they were very similar.

Plant tall, 6-7 feet; stalks slender, pale green foliage; tassel short and bushy; lateral spikelets numerous, short and stiff.

Ears borne rather low, 18-20 inches from the ground; husked ears moderately short and medium plump at the base, 6-7 x $1\frac{3}{4}$ - $1\frac{7}{8}$ inches, tapers decidedly to a point at the tip; rows entirely lacking. Silk abundant and long, difficult to remove. Kernels at milk stage white, small, narrow; at dry stage pale whitish amber, very thin and translucent, small, much longer than wide (215 seeds per oz.); cuneate; crown straight; surface wrinkled, often dimpled; set loosely on cob.

Nectar. Refs. 190, 345, 502.

This new "early" sweet corn was offered to the customers of the Ford Seed Company of Ravenna, Ohio, in 1907 for the first time. Nectar was originated by Hamilton De Graw of New York and was developed as the result of a cross between Malakhoff and White Evergreen. Nectar is of good quality and is a long standing sort, a character which it probably retained from its Evergreen parent.

At Geneva Nectar came into production in 94 days, 4 days earlier than Favorite and Stowell's Evergreen and 6 days later than White Cory. The variety most resembles Favorite, being of equal height, but retaining much less tendency to tiller. The ears are borne lower on the stalk and are inclined to be decidedly more pendant. The husked ears are 1 to 2 inches shorter, more cylindrical and more plump, containing 12 rows rather

consistently. The variety is one of the lesser known sorts which has potential possibilities as a valuable main crop market garden sort.

Plant tall, 7-8 feet; stalks heavy and straight; nodes 12-14, slightly exposed, not very prominent. Erace roots present, heavy, useful, and complete whorl on one node. Tillers few, slightly shorter than central stalk. Leaves long and medium broad, 36-38 x 3½-4 inches; sheath equal to and slightly shorter than internode. Tassel moderately long and heavy, 18-20 inches, coarse; terminal spike slightly drooping; lateral spikelets horizontal to slightly drooping, moderately many and rather crowded; bracts green, very slight to no red stripe present; anthers variable in color; 70-72 days to anthesis.

Ears borne at 5th and 6th nodes, one and very often two ears per stalk. Shank variable in length, rather slender, often pendant. Husks many, rather heavy, short, tightly wrapped and difficult to remove. Husked ear moderately long and medium plump, 8-9 x 1⅝-1⅞ inches; slightly tapering; base slightly enlarged and compressed; tip abruptly conical and slightly exposed to occasionally capped; rows 12, straight, occasionally somewhat irregular at base and medial, crowded around the cob.

Kernels at milk stage white, medium width and moderately deep; at dry stage distinctly whitened, opaque, medium size, slightly longer than broad, rather thin, 1.15 x .1 x .35 cm. (100 seeds per oz.); triangular; crown nearly straight; surface abundantly and rather deeply wrinkled; set rather loosely on cob.

New Early. Refs. 184, 185, 387. Syns. Forbes Early, Forbes New Early.

Introduced in 1912 by J. F. Noll and Company of Newark, New Jersey, this large second early is still distributed by Alexander Forbes and Company of the same city. Edible ears were produced in 83 days, 2 to 3 days later than Vanguard and Whipple's Early White. As grown at Geneva it proved to be one of the most vigorous of its class. The plants were about 1 foot shorter than those of Vanguard and Whipple's Early White with shorter leaves and equal minimum tendency to tiller. The husked ears were the same size as those of Whipple's Early White with less tendency to taper.

Plant medium tall, 5 to 6 feet; tillers few, considerably shorter than central stalk. Ears borne at 4th and 5th nodes, usually but one ear, occasionally an additional nubbin. Husked ear medium long and moderately plump, 7-8 x 1⅞-2 inches; slightly tapering; rows 12-16, straight and regular. Kernels at milk stage white, rather narrow and medium deep; at dry stage dull amber white; small, short and thick. Surface rather coarsely and shallowly wrinkled; set tightly on cob.

New Queen. Refs. 22, 274, 367, 368, 509. Syns. New Queen Sweet, Queen.

Fortunately, an account of this rather unique variety was included in the Annual Report of this Station for 1889. Although nothing is known regarding the origin and consequent introduction, J. A. Everitt of Indianapolis was one of the earliest houses to carry it. Verification of this must necessarily fall to R. L. Taft of the Michigan Experiment Station, who indicated the above source in his report of the variety.

C. E. Hunn of this Station described New Queen in his account of the variety as a very dwarf grower, producing stalks about 4 feet tall, tinged with red. The ears were 5 to 6 inches long and possessed 8 rows of large white kernels which reached edible maturity in 79 days. This suggests the possibility of New Queen being the

precursor of our present day Midget, a variety whose origin is uncertain. The descriptions as well as season strongly indicate at least a surprising likeness.

New Snowflake. Refs. 159, 287. Syns. Early Snowflake, New Early Snowflake, White Snowflake.

S. M. Isbell and Company of Jackson, Michigan, introduced this sweet corn in 1923. Information concerning its origin is unknown. Although the name Snowflake has been used previously, it has always referred to a field corn.

At Geneva edible ears were produced in about 80 days. The plants were about 4½ feet tall, slender, moderately inclined to tiller, and produced ears at the fourth and fifth nodes. The husked ears were medium long and moderately slender, 7 to 8 x 1½ to 1⅝ inches, possessing 10 to 12 rows of medium sized white kernels.

New Wonder. Ref. 337.

This is a new variety which was introduced in 1930 by J. M. McCullough's Sons Company, Cincinnati, Ohio. The originator, W. W. Kessler of Madison, Indiana, had experimented with this stock for 35 years. The variety as represented in our trials presented several characters which differed markedly in comparison with the same characters of other varieties. The size of ear in relation to lateness of season and height of plant and the number of ears on a stalk and their high position on the stalk were outstanding and distinct.

Ninety-seven days were required for New Wonder to produce edible ears at Geneva. This was 1 day earlier than Egyptian and Stowell's Evergreen and 2 days later than Henderson. The plants most resemble those of Egyptian but are slightly more slender. Both varieties produce the ears high, but New Wonder often produces three and four ears, some of them small, two and three nodes higher than those of Egyptian. The husks are slightly shorter but just as tightly wrapped and as difficult to remove. The husked ears are about the same length as those of Egyptian but decidedly more slender. In the dry stage the kernels are set tighter on the cob. The variety is little known, but coming as late as it does it provides a delicate, small, and tenderkerneled sweet corn for the late home garden.

Plant tall, 7½-8 feet; stalks moderately heavy and straight; nodes 14-15, usually covered, not prominent. Brace roots present, moderately heavy, whorl complete on two nodes and partly on the third, useful. Tillers few to none, much shorter than central stalk. Leaves long and medium width, 34-35 x 3-4 inches; sheath longer than internode. Tassel medium long, 16-18 inches, heavy and rather coarse, occasionally streaked with red at the base; terminal spike erect; lateral spikelets nearly horizontal, medium long, many present, multi-branched and crowded; bracts green, very slightly striped with pale red, often entirely lacking; anthers buff (deep colonial buff); 75-76 days to anthesis.

Ears borne at 7th, 8th, 9th and 10th nodes, two ears with an additional nubbin or two often present; shank short and slender, 2-3 inches. Husk leaves variable in number, light and very short; husks medium in number, rather short, tightly wrapped and rather difficult to remove. Husked ear moderately long and slender, 8-9 x 1½-1⅝ inches, moderately tapering; base compressed; tip long, conical and exposed; rows 12, moderately straight, slightly irregular at the base, crowded around the cob.

Kernels at milk stage white, small, narrow and medium depth;

at dry stage distinctly opalescent white, considerably longer than wide, thin; 1.2 x .87 x .33 cm. (160 seeds per oz.), triangular; crown distinctly rounded; surface rather coarsely and shallowly wrinkled, occasionally creased; set moderately tight on cob.

Nonesuch. Refs. 97, 121, 220, 238, 350, 352, 403, 412, 454, 508, 512, 514. Syns. Clark's Early Nonesuch, Maule's Nonesuch.

This variety was the first new variety produced by C. S. Clark of Wakeman, Ohio. It was introduced in 1892 by Wm. Henry Maule of Philadelphia. An outstanding stalk was noticed by Mr. Clark in one of his growing seed crops (possibly Cory) and the specimen ear saved. By selection the corn known as Nonesuch was developed and sold to Maule. The variety is unique because of the uniformly white grain and pink ear.

Edible ears were produced at Geneva in 93 days, 8 days later than Red Cory, about the same season as Delicious and 3 days earlier than Henderson. The plants are 1½ to 2 feet taller than those of Red Cory, considerably heavier, and have tassels slightly longer, both terminal and lateral spikelets. The amount of red on the foliage is about the same on both varieties with Red Cory being more consistent and uniform in this respect. The husked ears are 2 to 3 inches longer, more plump than those of Red Cory, and have 4 to 6 more rows of kernels. Kernels at the dry stage are nearly white instead of red as in Red Cory, but the cob is red. For all practical purposes, this old variety is of no significance today. Those stocks that are available are too variable to be of much value.

Plant moderately tall, 6½-7 feet; stalks moderately heavy and straight; nodes 10-12, covered, not prominent, streaked at base with red. Brace roots present, moderately heavy, whorl complete and useful on one node. Tillers few, slightly shorter than central stalk. Leaves moderately long and medium broad, 32-34 x 3½-4½ inches, often colored along the margin; sheath equal to and longer than internode, usually streaked with light red. Tassel moderately long and medium heavy, rather coarse, 18-20 inches, usually colored at the base; terminal spike erect; lateral spikelets horizontal to somewhat erect, moderately many, medium long, rather crowded and branched at the base; bracts and anthers variable in color; 73-74 days to anthesis.

Ears borne at 4th and 5th nodes, one and occasionally two ears per stalk, one usually a nubbin. Shank medium length, 3-5 inches, rather tough. Husks many, heavy, moderately long and often slightly streaked with pale red; somewhat variable in this respect. Husked ear moderately long and medium plump, 8-9 x 1¾-1⅞ inches, moderately tapering; base enlarged and expanded; tip long conical and exposed; rows 12-14, straight, occasionally somewhat irregular at the tip, moderately crowded around the cob.

Kernels at milk stage white with a pinkish tint at the base, small, rather narrow and definitely shallow; at dry stage dull yellowish white, red glumes adhere to base; slightly longer than broad, 1.0 x .94 x .42 cm. (120 seeds per oz.); short, broad, triangular in shape; crown rounded; surface shallowly and rather abundantly wrinkled; set slightly loose on red cob.

Nonpareil. Refs. 75, 91, 121, 138, 338, 367, 368, 411, 412, 440, 503, 537, 538. Syns. Stabler Early Pedigree, Stabler Extra Early Pedigree, Stabler's Nonpareil.

This was a variety first offered by Henry A. Dreer of Philadelphia in 1894 and continued for the succeeding 6

years. It was known also as Stabler's Nonpareil and the similarity of this name to Stabler's Early, a very popular variety, had much to do with influencing growers to try the Nonpareil. It was advertised as a second early of particular value to the canning trade.

Plant tall, 7-8 feet; stalks heavy; tassel heavy, rather stiff. Ears 6-8 inches long, 1½-2 inches in diameter; rows 12-14, regular. Dry kernels opalescent white, as broad as deep, medium size, wrinkled; reached edible maturity in 90-92 days.

Nordheim. Refs. 470, 483, 530. Syns. Earliest Nordheim, Early Nordheim, Extra Early Nordheim, Ihrig's Nordheim.

The John A. Salzer Seed Company gives to Mr. Ihrig, a Minnesota gardener, credit for originating this variety. Ihrig claimed it was bred from Early Minnesota. The exact date of introduction is unknown, although as well as can be determined of the several companies that listed it, Thorburn was the first, featuring it in his 1910 catalog. He introduced it as "on the style of Minnesota but far exceeding that variety in earliness and productiveness." Reports indicate that the variety produced plants about 6 feet high, usually bore two ears about 8 inches long, possessing 8 rows of broad, white grains.

Northern Pedigree. Refs. 22, 73, 89, 90, 91, 95, 96, 121, 125, 126, 172, 240, 367, 368, 397, 411, 412, 437, 438, 440, 508, 511, 512, 514, 535, 536, 537, 538. Syn. Pedigree.

Northern Pedigree sweet corn was one of the items offered in the thirteenth regular Seed Distribution list of the *Rural New-Yorker* for 1887. William Falconer, a contributor to the columns of that paper, wrote in 1886 "in quality it (Northern Pedigree) is unsurpassed for excellence by any other sweet corn I ever ate. Indeed, I'd as soon eat it uncooked as cooked." It was sold by Ferry, Thorburn, and Gregory until about 1895. The early history of the variety is not definitely known; the following account, however, was published in the *Rural New-Yorker* in 1886 as a direct quotation from the originator:

"I can give no history of the Northern Pedigree Sweet Corn, except that for many years it has been a favorite early variety in my family. I do not know where it first came from as the time is beyond my remembrance. For at least 25 years the earliest and best formed ears have been saved for stock. This has resulted in securing the sweetest and most perfectly formed ears of any early sugar corn known."

Plant moderately short, 4-4½ feet; stalks very slender; foliage scanty and short; tassel short, stiff and simple; tillers very few. Ears borne low, 8-12 inches from the ground, usually two ears per stalk. Husked ears moderately short and slender, 5-6 x 1¼-1½ inches, moderately tapered; base usually enlarged and slightly expanded; tip conical and slightly exposed; rows 8, nearly straight, pairs somewhat noticeable at the base, otherwise crowded around the cob. Kernels at milk stage white, rather broad and shallow; at dry stage amber white, broader than long, medium size; broad ovate; crown rounded; surface slightly wrinkled, often nearly smooth; set tightly on cob.

Old Colony. Refs. 22, 87, 89, 90, 91, 93, 121, 126, 137, 171, 214, 238, 241, 274, 313, 341, 342, 343, 344, 350, 397, 404, 411, 417, 418, 433, 507, 508, 510, 511, 512, 513, 514, 515, 517, 532, 533, 535, 536. Syns. Early Old Colony, "Landreth Sugar," Old Colony Sugar, Sonyea Intermediate.

So far as the published records of sweet corns are concerned, Old Colony is indeed one of the earliest known varieties. Its history was carefully noted and most graciously publicized by a communication from the originator, the Rev. A. R. Pope, Somerville, Massachusetts, in the *Magazine of Horticulture* of December 1850. After nearly a century since its introduction there can be no improvements nor corrections on the story of the early struggles of the variety to gain stability and fame. The following is quoted directly from the original of 1850:

"It is a hybrid, as one can readily perceive by inspection, from the Southern White, and the common sweet corn of New England; and exhibits certain characteristics of the two varieties combining the size of the ear and kernel, and productiveness of the southern, with the sweetness and tenderness of the northern parent;—a southern head, *rara avis*, with northern principles. Indeed, nature seems to have rewarded the effort to improve her productions, by giving more than an even share of the desirable qualities for table use.

"The process by which it was attained will date as far back as 1845, when a single kernel, which escaped the denizens of the barnyard, was carried with the compost to my garden in Kingston, (Old Colony) and springing up was permitted, for the novelty to develop its nature in a huge stalk, bearing upon it, more or less matured, five ears of corn, one of the ears having 18 rows. The productiveness, combined with the extraordinary size of the ear and kernel, suggested the plan of seeding the cob, when better acclimated, with sweet corn.

"In 1846 and again in 1847, a few hills were planted and in the later year at the proper time, before the anthers had burst, the stamens or spindles were carefully removed. As soon as the pistils or silk seemed in a mature state, the opening stamens of sweet corn stalks were carefully brought and the pollen from them gently shaken upon the pistils. At the time of harvesting more than one-half of the kernels bore all the ordinary outward appearances of sweet corn and had the sweetness peculiar to that variety."

Here is the definite story of crossing sweet corn upon field corn. Selection of the sweet corn kernels was followed by planting and careful observation of the resulting plants which proved to be quite variable in height and vigor. Seed was saved from the few plants that seemed to take the middle course between the dwarfs and the giants. In 1849 a new sweet corn was completed and with what satisfaction, having practically no competition all the superlative adjectives could be used in a description of the variety. The editor of *Horticulture* commented on this wonderful new culinary vegetable with the following sentence: "Yet we

see what good results have been obtained, simply by a little forethought, combined with a knowledge of the great effects of hybridization."

Old Colony was truly one of the favorite varieties for the next 50 years, its long keeping quality, its gourd-seed shaped kernels, its sweetness, were only minor details in the general assembly of qualities that caused one writer to say "Old Colony of all varieties is my favorite for that ambrosial mixture called succotash."

In catalog descriptions it was often reported that the variety was lost and found several times. This might possibly account for the separate listing by Sturtevant, who, in 1884, describes Clark's Old Colony as separate from the Old Colony given by Burr in 1863. Be that as it may, the name Old Colony represented a leading type for many years and has only faded away with the general decline of the white varieties.

At Geneva Old Colony produced edible ears in 90 days, 8 days earlier than Stowell's Evergreen, in season with Columbus Market, and 2 days later than Howling Mob. The plants were 1 to 1½ feet shorter than those of Stowell's Evergreen, but otherwise were very similar. The husked ears were 1 to 2 inches shorter but just as plump, while the kernels in the dry stage were not as deep as those of Stowell's Evergreen and lacked the converging crown. This sort was used for many years as a leading canning variety, but within the last 8 or 10 years has been replaced by others. Today it is practically impossible to obtain the true stock of Old Colony.

Plant moderately tall, 6-6½ feet; stalks heavy and straight; tillers many, nearly as tall as central stalk. Tassel moderately long, lateral spikelets medium in number, moderately erect, long, rather scattered and multi-branched. Ears borne at 4th to 6th nodes, often two ears per stalk, occasionally an additional nubbin present. Husk leaves few, short and light; husks rather thin, moderately tightly wrapped. Husked ear medium long and plump, 7-8 x 2½-2¾ inches, partly cylindrical to slightly tapering; tip abruptly conical to rounded; rows 12-14, regular and moderately straight, crowded around the cob.

Kernels at milk stage white, moderately broad, thick and deep; at dry stage amber white, rather large, (127 seeds to the oz.), longer than broad; triangular; crown slightly rounded; surface rather heavily wrinkled; set loosely on cob.

Oregon Evergreen. Refs. 4, 5, 203, 295. Syn. Early Oregon Evergreen. Illus. 62.

This member of the Evergreen family originated in Los Angeles County, California, and was first offered in 1904 by the Johnson and Musser Seed Company of Los Angeles. It has steadily increased in popularity and on the West Coast ranks in a comparative way with the standing of its cousin, Stowell's Evergreen, in the East.

At Geneva this variety required 99 days to come into production, 1 day later than Stowell's Evergreen, in season with Long Island Beauty, and 4 days earlier than Cincinnati Market. Oregon Evergreen produces plants as tall as those of Stowell's Evergreen with tassels of equal length, but with decidedly more numerous and crowded lateral spikelets. The husked ears are slightly longer and more slender with a more decided taper.

The kernels in the dry stage are intermediate in width between Narrow Grain and Stowell's Evergreen, lack the converging crown, and are set more tightly on the cob. It is used more for late sweet corn on the Pacific Coast than any other variety. Its more tightly wrapped and longer husks give it greater protection against the corn ear worm, a factor of great importance to the industry in that section. It is of little importance in other sections.

Plant tall, 7-7½ feet; stalks heavy and straight; nodes 12-14, covered, not prominent. Brace roots present and complete on one node, slender and useful. Tillers moderately many, slightly shorter than central stalk. Leaves moderately long and medium broad, 32-34 x 3½-4 inches; sheath longer than internode. Tassel moderately long and heavy, 18-20 inches; terminal spike erect; lateral spikelets horizontal to slightly drooping, many, moderately long, crowded and usually multi-branched; bracts green, very sparsely striped with pale red; anthers buff colored (deep colonial buff to pinard yellow); 72-74 days to anthesis.

Ears borne at 5th and 6th nodes, one and occasionally two ears per stalk. Shank short and heavy, 2-3 inches. Husk leaves few and short. Husks many, moderately heavy, rather short, tightly wrapped, difficult to remove. Husked ear long and plump, 9-10 x 2-2½ inches, moderately to decidedly tapering; base enlarged and compressed; tip conical, slightly exposed to occasionally capped; rows 14-16, moderately straight, occasionally somewhat spiral and lost at the base, crowded around the cob.

Kernels at milk stage white, medium size, rather narrow and medium depth; at dry stage dull white, longer than wide, medium size, 1.04 x .84 x .40 cm. (124 seeds per oz.); triangular in shape; crown slightly rounded; surface abundantly and often very finely wrinkled; set slightly loose on cob.

Papoon. Ref. 427.

This was the name given to the corn brought to Plymouth, Massachusetts, in 1779 by Lieut. Richard Bagnol, and is the first recorded sweet corn cultivated by the white settlers. It came from the valley of the Susquehanna in New York State at the time of the expedition against the tribes of the Six Nations under the command of General Sullivan. The color of the cob of this corn was called "a bright crimson," but the color of the dry seed was not given. C. N. Bement, writing in 1853, says of this early Plymouth corn, "There are two kinds of corn; one with the cob red and the other with the cob white. The ears are short and usually contain eight rows, the grains of which, when mature, are of a light color and become shrivelled and appear as if they were unripe." This must serve as a description of the first recorded variety of sweet corn of our civilization. It came from the Indian farmers of the fertile lands of up-state New York and was the forerunner of other varieties which came from the same or other Indian sources. From these native sweet corns and by crosses of these with the original Indian varieties of field corns have come the hundreds of named forms contained in this volume.

Pee and Kay. Refs. 22, 73, 74, 89, 91, 94, 95, 96, 121, 350, 368, 397, 411, 503, 508, 510, 511, 512, 533, 536, 537, 538. Syn. Western Queen — Shumway.

Price and Knickerbocker's Pee and Kay, named for the initials of the partners of this seed company, was introduced about 1885. This Albany seed company was responsible for several important sweet corn varieties,

and listed all of the leading sorts in their catalogs. On the market it proved to be very salable and hence popular with both farmer and market gardener. No historical information is available, but according to descriptions it belonged in the same group with Asylum.

Plant moderately tall, 6-6½ feet; internodes short. Ears medium long and plump, 6-8 x 1¾-2 inches; kernels large, nearly broad as long, very thick; about 85 days to edible maturity.

Peep O'Day. Refs. 77, 158, 238, 241, 242, 284, 298, 388, 406, 516, 517, 518, 533, 546. Syns. Improved Peep O'Day, Queen of the Earliest.

As an early variety, Peep O'Day was at one time an important sort for the home and market gardener. Introduced in 1901 by Northrup, King and Company, it soon became popular in the Middle West. The name itself was rather catchy and well suited to advertising, for nothing, not even the "early bird," could be ahead of the "peep of day." In several catalogs, Burpee in 1909, Vaughan in 1919, the Dakota Improved Seed Company in 1913, the similarity of this variety and Malakhoff is especially noted.

Eighty-four days were required for Peep O'Day to produce edible ears at Geneva. This proved to be 4 days later than Whipple's Early, in season with Kendel's Early Giant, and 4 days earlier than Howling Mob. The plants are about 1 foot shorter than those of Kendel's Early Giant, nodes more consistently prominent, and tassel slightly shorter both in terminal and lateral spikelets. Husked ears are about the same length but slightly less plump and more tapering. Peep O'Day was for several years a popular early market and home garden variety.

Plant medium tall, 5-5½ feet; stalk moderately slender and straight; nodes 9-10, covered, not prominent. Brace roots not present. Tillers many, slightly shorter than central stalk. Leaves medium long and moderately narrow, 28-30 x 3-3½ inches; sheath equal to and often longer than internode, slightly streaked with red near the base. Tassel medium long and slender, 15-18 inches; occasionally streaked with red at the base; terminal spike erect; lateral spikelets horizontal to slightly drooping, moderately many, rather short, crowded; bracts and anthers variable in color; 60-62 days to anthesis.

Ears borne at 3rd and 4th nodes, one and often two ears per stalk, one usually a nubbin. Shank usually short and slender, 2-4 inches. Husks moderately many, medium long, rather tightly wrapped but easily removed. Husked ear medium long and medium plump, 7-8 x 1½-1¾ inches; moderately tapering; base enlarged, slightly open; tip conical and exposed; rows 8-12, straight, regular, 8-rowed ears show rows noticeably paired; furrows deep and narrow.

Kernels at milk stage white, medium size, rather shallow and medium wide; at dry stage medium size, slightly longer than wide, .92 x 1.0 x .38 cm. (140 seeds per oz.); triangular in shape; crown slightly rounded; surface, moderately abundant, coarse and shallowly wrinkled; set tightly on cob.

Perfection. Refs. 22, 30, 273, 328, 370, 401, 403, 444, 485, 529.

The name "Perfection" has been used for several strains or stocks of sweet corn. Among others we have noted the following: Thorburn's Early White Perfection, 1908; Low's Perfection, 1892; Scott's Early Perfection, 1913; White Perfection from Beckert, 1913; Perfection from Grey, 1914; Howard's Perfection, 1915;

Price and Reed's Perfection, 1913; Willet's Perfection, 1914; and Perfection Early of Moore and Simon, 1907. These various stocks are not all available today and those grown in our trials were not consistent in type from year to year. The various catalog descriptions show variation from the 8-row type illustrated by Scott in 1913 to the 12-row type known as Price and Reed's Early Perfection.

Although the name Perfection would indicate a "supremely excellent" strain or stock or at least one "without defect or lack," we have been disappointed in our trials of varieties so named. It is said that "the best judges never pronounce a work of art perfect, because they always see ideal possibilities not yet attained." Perhaps, therefore, the name "Perfection" used for a variety, whether it be sweet corn, tomato, or what not, constitutes in itself a handicap, for all conditions under which a plant grows tend to make perfection exceedingly difficult of attainment.

Perry's Hybrid. Refs. 22, 48, 61, 73, 74, 89, 91, 93, 94, 121, 126, 207, 208, 238, 241, 244, 274, 278, 312, 329, 350, 368, 397, 403, 405, 411, 457, 503, 508, 510, 511, 512, 518, 533, 535, 537, 538. Syns. Large Cob Sugar, Perry, Perry's Hybrid Early.

This was an old variety originating in the East and rather favorably known from 1888 to the forepart of the present century. There is no definite information of its history, although some authorities credit its origination to A. D. Perry of the Perry Seed Store (now F. H. Ebeling), Syracuse, New York. The occasional red or pink cob serves as a clue to the original cross which must have been between a white cob and a pink cob variety. The regular and well filled ears are attractive and there is still a call for the variety in certain sections. To fill these orders, a similar corn, but with white cob, known as Mayflower No. 2, is frequently used today.

Plant medium tall, 5-6 feet; stalks moderately slender. Tassels slender, lateral spikelets drooping. Ears borne 20-30 inches from the ground. Husk leaves few, short and small. Husked ear moderately long and medium plump, 8-10 x $1\frac{1}{8}$ - $1\frac{1}{4}$ inches, partly cylindrical and slightly tapering; tip sharply conical; rows 8-10, often slightly irregular and separated at the base, otherwise crowded around cob. Kernels at milk stage dull white to pinkish, kernels rather broad and shallow; at dry stage dull yellowish white, large, broader than long; broad ovate; crown distinctly rounded; surface moderately wrinkled.

Pharaoh's Dream. Refs. 238, 241, 282, 406.

The Iowa Seed Company of Des Moines introduced this variety in 1903. No records are available to indicate the exact parentage, although it was supposed to have originated "from a cross made of two well known varieties and selected for a number of years until it had attained its high value."

The variety has been featured by the introducers continuously, although so far as is known, it has not been carried by any other leading seedsmen, at least under this varietal name. Although the introducers exploited the idea of Pharaoh's Dream of a stalk possessing seven ears, reports from experiment stations as

early as 1906, as well as records obtained at Geneva, indicate nothing unusual in respect to this character.

Trials at Geneva show the variety capable of producing plants 7 to 8 feet tall, with a decided tendency to tiller, bearing 1 to 2 ears per stalk which reach edible maturity in 97 days. The husked ears are 8 to 9 inches long, moderately plump, and possess 12 to 14 rows of medium sized, white kernels.

Pickaninny. Refs. 156, 298, 330, 331, 332, 333, 334, 335, 345, 348, 571. Syn. Early Pickaninny.

In the year 1916, Thos. A. Peters of Hampton, New Brunswick, sent to the Horticultural Division of the Central Experimental Farm at Ottawa some seed of a black sweet corn. In 1918, after 2 years' trial to determine its comparative earliness, it was crossed with Sweet Squaw, the latter being the seed parent. The black corn from New Brunswick was thought to have originated as a natural cross between Black Mexican and a corn native in that district.

From the cross made by Arthur J. Logsdaile in 1918 the best black strain was selected, named Pickaninny in 1919, and introduced in 1920. For several years it was not an entirely pure stock but continued selection corrected this. It was tried throughout Canada and met with considerable success and was found to be the earliest sweet corn ever grown at Ottawa, with the exception of the original black variety which came from Mr. Peters. At many of the more northerly points in Canada it proved to be the first sweet corn that would mature its seed.

Pickaninny produced edible ears at Geneva in 69 days, the earliest of all sweet corn varieties. This was 1 day earlier than Aroostock Early and 6 days earlier than Alpha. The plants have a greater tendency to tiller than those of Black Mexican and are decidedly smaller in every respect, with darker green foliage. The husks are more loosely wrapped and the husked ears are much shorter and somewhat more slender. Approximately the same color change occurs with the kernels of both varieties. This variety has much the same quality as that of Black Mexican and is much earlier. Its small size, however, together with the lack of attractiveness in the post milk stage, has limited its usage to the home garden. Those who appreciate early sweet and tender corn in spite of unattractive color will find Pickaninny worthy of trial.

Plant very short, $2\frac{1}{2}$ -3 feet; stalks straight and slender; nodes 5-6, covered, not prominent. Brace roots present, very slender, somewhat useful, whorl not complete. Tillers many, much shorter than central stalk, some of which usually terminate with a nubbin. Leaves short and narrow, 15-18 x $2-2\frac{1}{2}$ inches; sheath longer than internode. Tassel very short and slender, 9-10 inches; terminal spike erect; lateral spikelets nearly horizontal, few present, short and simple; bracts pale green, sparsely striped with pale red and ringed at the base with the same color; anthers uniformly pale yellowish green (barium to citron yellow); 54-56 days to anthesis.

Ears borne at 2nd and 3rd nodes, one and often two or three ears per stalk; shank short and slender, 1-2 inches, moderately tough. Husk leaves few, short and light, often extending horizontally to the ear. Husks few, short, light, loosely wrapped and easily removed. Silk scanty, short, easily removed, uniformly pale green-

ish yellow in color. Husked ear moderately short and slender, 5-6 x $1\frac{3}{8}$ - $1\frac{1}{2}$ inches; moderately tapering; base often open; tip conical, furrows deep and narrow; rows 8, paired rather noticeably, moderately straight, somewhat irregular at the base.

Kernels at milk stage white, soon turning to various shades of gray and purple in the post milk period, thence to black in the full dough stage; small, moderately broad and shallow; in the dry stage black, small, broader than long, .81 x 1.06 x .37 cm. (152 seeds per oz.); short broad oval; crown rounded; surface abundantly wrinkled; set slightly loose on white cob.

Pocohontas. Refs. 57, 225, 260, 335, 348.

This variety, a selection from White Cob Cory, was introduced by Peter Henderson and Company, New York, who secured it from a New York gardener about 1905 and offered it in their catalog of 1907. Pocohontas was obtained by the careful and painstaking effort of this gardener to whom earliness meant all. His work was eminently successful, for the variety had hosts of friends who grew it for their first crop corn. In 1916, the Joseph Harris Company offered a new Extra Early Pocohontas which reputedly was even earlier than the original. This variety has been particularly successful in the New England district when grown for the Boston Market.

At Geneva 79 days were required to produce edible ears. This was 2 days later than Surprise, 4 days later than Early Mayflower, and 1 day earlier than Mammoth White Cory. Pocohontas was much like Surprise, although more inclined to tiller. The ears have much longer and heavier husk leaves and somewhat longer husks. The husked ears are slightly longer but otherwise are much the same. For all practical purposes the two are of similar utility, their use depending upon personal opinion as to their value in any given area.

Plant moderately short, $4\frac{1}{2}$ - $4\frac{3}{4}$ feet; stalk slender, moderately straight; nodes 7-8, slightly exposed, moderately prominent. Brace roots not present. Tillers many, somewhat shorter than central stalk. Leaves medium long and narrow, 28-30 x $3-3\frac{1}{2}$ inches; sheath usually shorter than internode. Tassel medium long and slender, 15-18 inches; terminal spike erect; lateral spikelets moderately erect, many, short, crowded; bracts green, sparsely striped with red; anthers variable in color; 60-62 days to anthesis.

Ears borne at 2nd and 3rd nodes, one and occasionally two ears per stalk, one often a nubbin. Husk leaves moderately many, long and heavy. Husks moderately few, medium heavy, rather tightly wrapped, easily removed. Husked ear medium long and medium plump, 7-8 x $1\frac{5}{8}$ - $1\frac{3}{4}$ inches; moderately tapering, often partly cylindrical; base compressed; tip rounded to abruptly conical; rows 10-12, moderately straight, occasionally irregular at the base or inclined toward spiral arrangement.

Kernels at milk stage white, medium wide, thin and moderately shallow; at dry stage dull creamy white, slightly wider than long, small, .94 x 1.04 x .39 cm. (140 per oz.); short oval in shape; crown rounded; surface sparsely and very shallowly wrinkled; set tightly on cob.

Portland Hybrid. Refs. 97, 238, 241, 388, 404, 503, 513, 516, 533. Syn. Portland.

Northrup, Braslan and Goodwin Company, Minneapolis, Minnesota, cataloged a variety in 1893 as Portland Hybrid. This evidently became known as Portland (and continued as such to 1921) soon after the change in the firm name to Northrup King and Company. Other than the descriptions and photographs in early catalogs, we have no authentic information on this variety.

Portland Market. Refs. 98, 204, 398, 400, 416. Syns. Early Portland Market, Superb.

The Gill Bros. Seed Company, Portland, Oregon, introduced this variety in 1910 as the result of several years careful selection and breeding from the Ferry variety Oakview Market. For many years it was exceedingly popular with local growers and is still grown to some extent in the Pacific Northwest, but it is chiefly known today as the variety from which Early Market was selected.

Edible ears were produced at Geneva in 75 days. Five days later than Early Market, in season with Early Mayflower and Alpha, and 4 days earlier than Pocohontas. Portland Market produces plants that are 1 to $1\frac{1}{2}$ feet taller than those of Early Market, slightly heavier, much longer in tassel, and have decidedly greater tendency to tiller. The husks are longer but not quite as tightly wrapped. Husked ears will average an inch longer and are somewhat more slender. The rows are 2 to 4 less in number and the tip is less rounded and more exposed.

Plant medium tall, 5-6 feet; stalks moderately slender and straight; nodes 9-10, exposed and prominent. Brace roots few present, very slender and of little use. Tillers many, equal to or slightly shorter than central stalk. Leaves moderately short and medium broad, 25-28 x $3\frac{1}{2}$ -4 inches; sheath shorter than internode. Tassel moderately long and heavy, 18-20 inches; terminal spike erect; lateral spikelets horizontal to somewhat erect, medium long, many present, usually crowded; bracts and anthers variable in color; 58-60 days to anthesis.

Ears borne at 3rd and 4th nodes, one and occasionally two ears per stalk, one often a nubbin. Shank variable in length, rather heavy. Husk leaves moderately many, rather long, light and slender. Husks many, heavy, long and rather tightly wrapped. Husked ear medium long and medium plump, 7-8 x $1\frac{3}{4}$ - $1\frac{7}{8}$ inches; moderately tapering; base enlarged and moderately compressed, occasionally open; tip conical and exposed, glumes very long; rows 10-12, moderately straight, occasionally somewhat irregular at the base, crowded around the cob.

Kernels at milk stage white, soon becoming creamy white, medium size, rather shallow; at dry stage amber white; slightly broader than long, thick, very prominent embryo extending to the crown, 1.0 x 1.08 x .46 cm. (88 seeds per oz.); oval in shape, crown decidedly rounded to semicircular; surface rather abundantly but shallowly wrinkled; set tightly on cob.

Potter's Excelsior. Refs. 11, 22, 42, 51, 52, 59, 73, 74, 89, 91, 121, 126, 162, 168, 214, 238, 241, 338, 344, 350, 367, 368, 397, 403, 405, 411, 420, 431, 435, 436, 444, 445, 464, 503, 507, 508, 512, 528, 533, 535, 536, 537. Syns. Conqueror, Early Conqueror, Early Excelsior, Excelsior, Excelsior Sugar, Excelsior Sweet, Large Excelsior, Lucky Strike, New Excelsior, Potter, Squantum, Squantum Sugar, Squantum Sweet.

The name Excelsior seems to have been the first used for this variety for it was listed by Thorburn as such in 1861. The name Potter's Excelsior seems to have been used first about 1878, but the earliest catalog reference we have is that of Gregory in 1882. Squantum as the name for this stock appeared about 1884 and was used by both Henderson and Gregory. In a recent letter Edgar Gregory says, "We considered Squantum Sugar the same as Potter's Excelsior. It

came from that variety and the difference was so slight it wasn't worth considering."

There is the possibility that the name *Excelsior* belonged to an entirely distinct variety, but there has been no way to check these names as to type. Potter's *Excelsior* might have originated by selection from *Excelsior* or, as suggested by S. M. Tracy, have resulted from a cross between *Early Minnesota* and "*Old Asylum*." From the early description as given by Sturtevant in 1884 we quote the following: "Mr. Potter says he exercised a careful selection, saving seed from both good and poor ears in order to hold the type in which the kernels are almost too sugary. In Mr. Potter's strain the ear is often oval in section from the tenderness of kernels yielding to pressure of its weight."

Potter's *Excelsior* produced edible ears at Geneva in 97 days, 1 day earlier than Stowell's *Evergreen*, in season with *Early Mammoth*, and 3 days later than *Delicious*. The plants are much like Stowell's *Evergreen*, possibly somewhat more stocky with less tendency to tiller and with longer tassels. The husked ears are slightly longer and more tapering. The kernels at the milk stage are shallower and thicker than those of Stowell's *Evergreen*, while in the dry stage the converging crown of the latter is absent.

Plant tall, 7-8 feet; stalks heavy and straight; nodes 12-14, usually covered, not prominent, internodes long. Brace roots present, heavy, useful and complete on one node. Tillers moderately few, slightly shorter than central stalk. Leaves decidedly long and medium broad, 36-38 x 3½-4½ inches; sheath equal to and often longer than internode. Tassel very long and medium heavy, 24-28 inches, rather coarse; terminal spike erect; lateral spikelets horizontal to slightly drooping, medium in number, very long, not crowded; bracts green, very sparsely striped with pale red; anthers variable in color; 73-76 days to anthesis.

Ears borne at 5th to the 7th nodes, one and occasionally two ears per stalk. Shank medium long, 4-5 inches, decidedly heavy. Husk leaves few, short and light. Husks many, long, heavy and tough, rather tightly wrapped, not very easily removed. Silk medium in amount, moderately long and uniformly pale red in color. Husked ear long and plump, 9-10 x 2½-2¾ inches, moderately to decidedly tapering; base enlarged and usually compressed, occasionally somewhat open; tip conical and somewhat exposed; rows 16-18, moderately straight, occasionally lost at the medial.

Kernels at milk stage white, medium size, shallow and decidedly plump; at dry stage opalescent white, somewhat longer than wide, 1.05 x .94 x .43 cm. (132 seeds per oz.); roughly triangular in shape; crown slightly rounded; surface exceedingly rough, deeply and abundantly wrinkled; set loosely on cob.

Pratt's Early. Refs. 90, 91, 427, 507, 508.

The description of this variety could well have been associated with the early *Papoon* corn of 1779. J. J. H. Gregory advertised *Pratt's Early* in 1874 as an acquisition for marketmen, a first early to come in before *Crosby*, *Moore's* or *Narragansett*. The only description, from Sturtevant in 1884, shows it to be quite similar to *Red River* but with whitish kernels. Ears 5 inches long, 8- to 10-rowed, usually tapering somewhat; kernels crinkled and strongly rounded.

Premo. Refs. 46, 131, 143, 201, 238, 241, 266, 298, 324, 335, 345, 348, 403, 406, 472, 518, 533, 546. Syns. *Early Premo*, *Extra Early Premo*, *Holmes' Premo*, *Sixty-Day Premo*.

This new variety, named *Premo* at the time of its introduction in 1910 by the Holmes Seed Company, Harrisburg, Pennsylvania, had been in possession of William Moody who lived on the river road near Harrisburg. His early corn topped the market and seed of the same was desired by many, but was rather difficult to obtain. Finally, as the story goes, Mr. Holmes offered Moody \$1.00 per seed for 12 grains. The offer was accepted and this variety had its start. It was very popular for many years and was known as a 60-Day corn. Stocks sold as *Premo* today have in some cases proved to be far different from the original.

Premo required 85 days to reach edible maturity at Geneva. This was in season with *Cory*, 3 days earlier than *White Cory*, and 5 days later than *Whipple's Early*. The plants were slightly taller than those of *Cory*, with more prominent nodes, but very similar in the tendency to tiller. The husked ears are of equal length, slightly more plump and more often produce 10-rowed ears. The kernels are much whiter in the milk stage and when dry lack the reddish tinge common to *Cory*.

Plant medium tall, 5-5½ feet; stalks slender and straight; nodes 9-10, exposed, prominent. Brace roots present, whorl complete, useful. Tillers few to moderately many, slightly shorter than central stalk. Leaves moderately long and medium broad, 30-32 x 3½-3¾ inches; sheath shorter than internode. Tassel medium long, rather heavy, 16-18 inches; terminal spike erect; lateral spikelets nearly erect, few, medium long, rather scattered; bracts dark green, heavily striped with dark red; anthers variable in color; 66-70 days to anthesis.

Ears borne at 3rd and 4th nodes, often two ears per stalk, one usually a nubbin. Shank moderately short and heavy, 2-4 inches. Husks medium number, size and wrapping. Husked ear moderately short and slender, 6-7 x 1½-1⅝ inches, slightly tapering; base compressed; tip conical, slightly exposed; rows 8-10, straight, regular, often noticeably paired.

Kernels at milk stage white, small, medium broad and shallow; at dry stage dull amber white, broader than long, thick, 1. x 1.26 x .45 cm. (132 seeds per oz.); short, broad ovate in shape; crown rounded; surface rather abundantly but shallowly wrinkled; set tightly on cob.

Price's 1900. Refs. 401, 533.

The exact date of introduction of this variety is unknown, although its inclusion in Tracy's list compiled in 1901 indicates that it was prior to that time. George H. Price of Albany, New York, made the introduction and, so far as is known, it has not been listed by any other seed organization under this name. Mr. Price discontinued growing this variety about 1930, largely because "demands at this time are almost entirely for yellow sweet corn."

Reports indicate "1900 produced a medium tall stalk, stout and strong, bearing its large ear well down on the stalk. The kernels were large, plump, white, sweet and tender."

Pride of America. Refs. 22, 188, 367, 368, 446.

This was another of the small, very early, red-cobed, 8-rowed sweet corns so popular 40 years ago. It was introduced by Frank Ford and Son of Ravenna, Ohio, about 1892. Mr. Ford gave its origin as northern Vermont where the shortness of the growing season practically prohibited growing those varieties requiring

a long season. The variety was carried until 1895 at which time it was displaced by a white variety, Extra Early Vermont, which apparently possessed every fine quality of the former in addition to having white kernels and cob.

Pride of Milford. Refs. 563, 565. Syn. Milford's Pride.

The stock of this variety was obtained by F. H. Woodruff and Sons of Milford, Connecticut, from a New York State grower. Definite information as to its origin is lacking, although it is said to be the result of a three-way cross involving Perry's Hybrid, Howling Mob, and Champion. It was introduced about 1919 by the above-mentioned firm under the name of Milford's Pride, "a name which somehow evolved into its more dignified state, Pride of Milford."

At Geneva edible ears were produced in 87 days, 1 day earlier than Howling Mob, 1 week later than Whipple's Early, and in season with Crosby. The plants of this variety are equal in height to those of Howling Mob, have fewer tillers, and more uniform coloring on the bracts and anthers of the tassel. The husked ears are about the same length and thickness but more tapering and abruptly conical to rounded at the tip. The kernels in the dry stage are longer in proportion to their width than those of Howling Mob, more distinctly triangular, and more coarsely wrinkled. Pride of Milford is used in a limited way as a home and market garden sort in the southern New England states.

Plant moderately tall, 6-6½ feet; stalks moderately slender and straight; nodes 10-12, slightly exposed and prominent, usually shaded red. Brace roots present, rather heavy, useful and whorl complete on one node. Tillers few, usually much shorter than central stalk. Leaves medium long and moderately broad, 30-32 x 4¼-4¾ inches; sheath equal to and often shorter than internode. Tassel moderately long and heavy, 18-20 inches; terminal spike erect; lateral spikelets horizontal to moderately drooping, many present, medium long, crowded; bracts green, sparsely striped with rather light red; anthers reddish bronze (orange vinaceous to terra cotta); 66-68 days to anthesis.

Ears borne at 5th and 6th nodes, one ear per stalk with an additional nubbin present. Shank variable in length, rather heavy. Husk leaves many, short and light. Husks many, long and rather tightly wrapped. Husked ear moderately long and plump, 8-9 x 1⅞-2⅞ inches; moderately tapering; base enlarged and compressed; tip abruptly conical to slightly rounded, usually exposed; rows 12-14, moderately straight, occasionally irregular and rather crowded around the cob.

Kernels at milk stage white, medium size and depth; at dry stage dull white, slightly longer than wide, 1.15 x .94 x .36 cm. (130 seeds per oz.); triangular in shape; crown slightly rounded; surface moderately wrinkled; set slightly loose on cob.

Prolific. Refs. 22, 91, 188, 238, 243, 253, 255, 276, 278, 284, 397, 422, 432, 535, 537, 538. Syns. Dwarf Prolific Sugar, Russell, Russell Early, Russell's Prolific, White Prolific.

The first use of the word Prolific was noted in connection with Russell's Prolific one of the older varieties cataloged by Vick in 1870, Gregory in 1872, Ferry in 1875, and others. The connotation makes Prolific a desirable variety name. However, in that respect it is probably similar to Perfection; liable to set up in the

growers mind a standard difficult of attainment, especially under adverse seasonal or soil conditions. Among the many stocks which have carried Prolific as part of the name, we have noted the following: Early Russell's Prolific, H. C. Anthony, 1913; Hasting's Prolific, 1911; Hunt's White Prolific, Hunt, 1923; Isbell's Prolific, Isbell, 1906; Blount's White Prolific, Johnson, 1914; and Simpsonia Prolific, Wilson, 1892.

In time of maturity the varieties mentioned above ranged from mid-season to late. Ferry says concerning Prolific, "It comes into use about a week after Early Minnesota."

These varieties were for the most part in rather limited use, and other than the brief material in the catalogs the descriptions available are rather scant. Russell's Prolific is treated by Burrill and McClure but not by Sturtevant. A listing by Beckert of Pittsburgh occurred as late as 1913. The description given below is based on the work of Burrill and McClure.

Plant moderately tall, 6-7 feet, tillers many; tassels long, with drooping lateral spikelets. Ears medium long and moderately plump, 6-8 x 1⅞-2 inches, nearly cylindrical; rows 10-12, straight; kernels at milk stage dull white; at dry stage dull amber white, crown slightly rounded; surface wrinkled; set loosely on white cob.

Quincy Market. Refs. 54, 207, 208, 238, 241, 514, 533.

The report of the Committee on Vegetables of the Massachusetts Horticultural Society for 1894 said, "A new variety of sweet corn was shown August 18, by P. G. Hanson, under the name of Quincy Market. We regard it as a very promising variety, and worthy of the special attention of market gardeners." This was first cataloged by Gregory in 1893 as a great favorite on the Boston market coming just after Cory and before Crosby. We presume that it was a selection from Crosby and named for Quincy, Massachusetts. Quincy Market was cataloged by Breck as late as 1932.

Ninety days were required for Quincy Market to produce edible ears at Geneva. This was 3 days later than Crosby, in season with Mimm's Hybrid, and 2 days earlier than Metropolitan. The plants are about the same height as those of Crosby, slightly heavier, have less tendency to tiller, and have shorter and more erect tassels. The ears are about the same length but slightly less plump. In kernels, arrangement, and tip characters, though, the two are very similar. The variety is little known outside of New England, and certainly because of its uniformity and attractiveness deserves a more extensive trial.

Plant medium tall, 5½-6 feet; stalk medium heavy and moderately straight; nodes 9-10, moderately covered, not prominent, often streaked or solid red at the base. Brace roots present, slender, whorl nearly complete and useful. Tillers few, equal to central stalk. Leaves medium long and medium broad, 30-32 x 3-4 inches; sheath equal to and occasionally shorter than internode. Tassel medium long and heavy, 16-18 inches, occasionally dark red at the base; terminal spike erect; lateral spikelets nearly erect to slightly drooping, medium in number, not crowded, usually branched at the base; bracts green, rather heavily striped with dark red; anthers usually reddish bronze (terra cotta); 66-68 days to anthesis.

Ears borne at 4th and 5th nodes, one and occasionally two ears per stalk. Shank variable in length, slender and brittle. Husks few, rather light, short, loosely wrapped and very easily

removed. Silk scanty, short and easily removed. Husked ear medium long and medium plump, 7-8 x $1\frac{1}{8}$ - $1\frac{3}{4}$ inches, slightly tapering and partly cylindrical; base flat and compressed; tip abruptly conical to rounded, distinctly capped; rows 16-20, straight, regular, very attractive, crowded around the cob.

Kernels at milk stage white; small, narrow and medium depth; at dry stage white, much longer than wide, thick, .93 x .68 x .42 cm. (152 seeds per oz.); roughly triangular in shape; crown straight, surface abundantly and finely wrinkled; set tightly on cob.

Red Cob Evergreen. Refs. 89, 91, 207, 208, 238, 256, 290, 322, 403, 411, 527, 535, 537. Syns. Early Red Cob Evergreen, Livingston's Evergreen, Livingston's Red Cob, New Red Cob Evergreen, Ohio Evergreen Red Cob, Pink Cob Evergreen.

Although the presence of red cobs among sweet corns was largely confined to the dwarf-growing, small, slender, 8-rowed varieties, an occasional large-eared sort came into existence. Such a variety was Livingston's Red Cob Evergreen. A. W. Livingston of Columbus, Ohio, relates in his 1892 catalog that he had introduced the variety over 30 years earlier as originating as a sport from Stowell's Evergreen. This would suggest the time of origin to be about 1860. About 1897 the introducer selected a white-cobbed strain. He continued to list both sorts under the name Livingston Evergreen until 1922 at which time a regular strain of Stowell's Evergreen was offered.

Plant tall, 7-8½ feet, stalks heavy, tillers many; tassel slender, with lateral spikelets drooping. Ears borne 2½-3 feet from the ground, generally cylindrical, tip abruptly conical to rounded, 8-9 inches long, 1½ inches in diameter, rows 10-12, regular, sometimes spirally arranged. Kernels white; as deep as broad, rather thick; wrinkled; set loosely on red cob.

Red Cob Sweet. Refs. 14, 87, 89, 91, 215, 272, 397, 404, 432, 507, 508, 511, 512, 518, 537. Syns. Early Red Cob, Red Cob, Red Cob Early Sweet, Red Cob Sugar, Red Sweet.

Hovey and Company, in 1859, and James J. H. Gregory, in his retail catalog for 1862 and 1863, listed Early Red Cob Sweet as an early and excellent variety of Indian corn. This was probably the same corn described by Burr in 1863 as Red-cob Sweet. Two types were described, one "usually twelve but sometimes fourteen rowed" and the other called a sub-variety with 8 rows. The kernels were roundish flattened, white when suitable for boiling, shrivelled, and of a dull, semi-transparent white when ripe. The red cob was called its most distinguishing characteristic.

The Early Red Cob Sweet of Gregory was listed for only 2 years, then in 1867 Large Red Cob Sweet was cataloged as very superior, coming in after the early varieties, with ear of large size, tender and sweet. This might have been the large 12- to 14-rowed type of Burr. In 1870 a Red Sweet corn appears which was considered similar to Sweet Mexican in quality but with no description given as to size, color of kernel or cob. Sturtevant in 1884 described a variety with red cob and whitish kernel having 12 rows. All of these variations in name referred to either an 8- or 12-rowed corn with red cob and whitish kernel. These could easily have furnished the stock that later became Marblehead and Cory.

Red Evergreen. Refs. 412, 415, 511, 512. Syn. Pink Evergreen.

John Lewis Childs of Floral Park, New York, introduced this variety about 1892 as a sport from the "common Evergreen." Because of its unique red kernels in the edible stage, it apparently was used by some growers interested in such novelties. It was rather short lived, however, having been discontinued in 1897 by the introducer. Reports indicate that it was a valuable late variety with dark red kernels, differing from Evergreen in only this respect.

In 1926 the Connecticut Agricultural Experiment Station sent out for trial a variety called at the time Red Leaved White Evergreen (Ref. 118). It had its origin with the Department of Genetics under the direction of Dr. D. F. Jones and was developed as "a first generation hybrid of inbred strains of Evergreen and another variety of miscellaneous origin." It represented one of the first attempts to breed sweet corn varieties by the use of inbred strains to attain greater vigor and uniformity. The variety name was first shortened to Red Evergreen and eventually to Redgreen under which name it is dispensed today by the Associated Seed Growers of New Haven, Connecticut.

The use of the name Red Evergreen is rather common in certain canning crop producing areas to refer to the hybrid inbred strain. It should not be confused with the variety discussed above, as there is no relationship of a varietal nature.

Redgreen produced plants 6½ to 7 feet tall, rather slender and straight, with a considerable tendency to tiller. The foliage was prominently marked with red along the midrib and margins as well as on the sheaths and exposed portions of the internodes. The tassels were very heavily shaded with red and possessed uniformly colored (warm buff) anthers. The husked ears were 7 to 8 inches long, 1½ to 1¾ inches in diameter, and possessed 12 to 14 rows of rather small, moderately narrow white kernels which reached edible maturity at Geneva in 90 days. In all characters a remarkable uniformity was in evidence and a definite demand created among growers and canners.

Red River. Refs. 430, 507, 508.

This variety, which originated in Minnesota where it was first known in 1878, was described by Sturtevant in 1884 as a sub-variety of Narragansett. The ears were about 4 inches long, cylindrical, bluntly rounded at apex; 8-rowed in general; kernel large, flatly rounded, crinkled, closely set, of a reddish flesh color.

Roslyn Hybrid. Refs. 22, 61, 74, 90, 91, 92, 95, 96, 214, 238, 328, 368, 405, 491, 503, 508, 514, 533, 535, 537. Syns. Roslyn, Roslyn Hybrid Sugar, Roslyn Hybrid Sweet.

Henry Stabler of Roslyn Farm in Montgomery County, Maryland, commenced growing and working with sweet corn about 1844. As a result of his great interest and knowledge of sweet corn he and his son, Dr. Augustus Stabler, were responsible for the introduction of 3 important varieties of sweet corn. Roslyn



OREGON EVERGREEN

(Three-quarters natural size)



SILVER BANTAM

(Natural size)

Hybrid was one of these varieties, the history of which is taken from Bulletin No. 96 of the Maryland Agricultural Experiment Station: "In the year 1878 the crop of sweet corn at Roslyn Farm consisted of about 30 acres, nearly half of which was planted from improved seed of Stowell's Evergreen, and the remainder was of the variety known originally as Burr's Mammoth. A careful comparative study of these 2 varieties showed that each possessed certain points of superiority which the other did not. In the autumn while selecting seed the thought occurred that it might be possible to produce a hybrid from these two varieties. Five ears of Stowell's and seven of Mammoth satisfied all requirements and were saved. In the spring of 1879 this seed was planted, the first row to Stowell's and the second to Mammoth and so on until the seed was used up. When the tassels began to appear they were removed from the rows of Stowell's leaving the Mammoth intact. Seed was saved from the Mammoth rows and in the spring of 1880, 3 varieties, Mammoth, Stowell's and the Hybrid were planted. At the close of the season it was perfectly evident that the Hybrid was far superior to the others and in succeeding years selection of this stock was made each year and called Roslyn Hybrid."

The new variety was rather slow in getting into trade channels, but was listed by Henderson in 1892, Thorburn in 1893, and Dreer in 1894.

Plant tall, 7-8 feet, stalks heavy; foliage abundant. Tillers few. Tassel long, heavy, stiff, multi-branched. Ears borne 24-30 inches from the ground. Husked ear long and plump, 8-10 x 1 7/8-2 1/4 inches, moderately tapering; base compressed; tip rounded and nearly capped; rows 12-16, straight, regular. Kernels at milk stage white, moderately narrow and deep; at dry stage dull amber white, 1 1/4 times as long as broad; surface wrinkled; set rather loosely on cob.

Ruby. Refs. 2, 53, 65, 75, 90, 91, 94, 238, 350, 367, 405, 408, 411, 503, 511, 514, 533, 536. Syns. Improved Ruby, Ruby Sugar, Ruby Sweet.

Ruby as originally introduced was entirely distinct from other varieties by reason of the stalks and husks, which were of a very handsome dark red color giving it an odd and beautiful appearance in growth. C. N. Brackett of Newton, Massachusetts, originated this new corn and sold seed from his reselected stock to W. Atlee Burpee who offered it in 1892. A previous introduction of the variety in 1888 had been premature because less than half of the plants came true from seed. Burpee called his introduction Improved Ruby and featured it until 1903. The only other sort having similar color characteristics, which had appeared previously, was Farmer's Club, a much smaller growing variety.

The records of the Massachusetts Horticultural Society for 1888 show that a First Class Certificate of Merit was awarded C. N. Brackett, Chairman of the Committee on Vegetables of the Massachusetts Horticultural Society from 1866 to 1898, for Ruby Sweet Corn, a new and novel variety, originating with him, with ruby-colored husks and stalks and pure white kernels of excellent quality. Ruby was more of a novelty than a practical variety and its use was largely by the home gardener and amateur horticulturist.

Plant tall, 6-8 feet, stalks heavy; foliage abundant and large, dark red in color. Tillers many, nearly as tall as central stalk. Tassel long, laterals many, drooping and crowded. Ears borne 24-30 inches from the ground; husks dark red in color; husked ears moderately long and plump, 8-9 x 1 7/8-2 1/4 inches, moderately tapering; tip rounded to abruptly tapering; rows 12-16, moderately straight at medial and apex but usually somewhat irregular at the base. Kernels in milk stage creamy white, at dry stage dull white, large, longer than broad, decidedly thick; crown slightly rounded; surface wrinkled; set rather loosely on purplish white cob.

Saunders. Refs. 386, 568. Syns. "Second Early," Saunders' Second Early.

S. D. Woodruff introduced a variety of sweet corn in 1907 which he called Saunders, after the name of the man near Albany, New York, from whom the stock seed was obtained. Although the introducer speaks of it as a hybrid, the exact parentage is not mentioned. Concerning the variety the introducers write, "An extra early, part red and part white cob with an ear 40 per cent larger than Red Cory, full as early and wonderfully sweeter and more prolific." It was also listed the same year by J. F. Noll and Co. of Newark, New Jersey. Both companies, however, discontinued it 2 years later.

September Morn. Ref. 134.

This large, many-rowed variety originated with V. H. Neilsen of Council Bluffs, Iowa, as the result of a cross involving Country Gentleman and Stowell's Evergreen. After 5 years of selection to obtain a stock with straight rows that still retained the depth of kernel characteristic of Country Gentleman, the variety was transferred to the Di Giorgi Brothers of the same city who introduced it about 1917 and have since continued to list it.

At Geneva it produced edible ears in about 100 days, a few days later than Stowell's Evergreen and Country Gentleman. In many ways it resembled a stock of Narrow-grained Evergreen, since a large number of narrow rows was its outstanding characteristic.

Plant tall, 7-8 feet, stalks heavy and straight; tillers few. Ears borne at 5th and 6th nodes, one and two per stalk; husks many, very heavy and tightly wrapped. Husked ears moderately long and plump, 8-9 x 2-2 1/4 inches, slightly tapering; rows 18-24, usually regular. Kernels at milk stage white, very narrow, thin and deep.

Shakers. Refs. 22, 61, 73, 89, 91, 126, 207, 208, 214, 238, 241, 278, 328, 329, 350, 368, 401, 403, 411, 503, 508, 512, 533, 536. Syns. "Aspinwall," Shaker's Early, Shaker's Early Sweet, Shaker's Large Early.

This sweet corn, a superb early variety in its day, originated among the Shakers in New York State and was introduced about 1888 by J. M. Thorburn & Co. of New York City. As first offered this was a fine-appearing sort with large 12-rowed ears well filled, in season in the interval between Crosby and Stowell's Evergreen.

In 1910, Aspinwall, similar to and a selection from Shakers, was put on the market by William F. Aspinwall of Loudonville, New York, and also by the South Family of Shakers. This was listed in 1913 by the George H.

Price Seed Co. of Albany, New York. For 20 years it was rather popular in this section but was finally discontinued in 1933.

In trials at Geneva the earliness feature of Shaker's Early has not been pronounced since it requires 95 days to reach edible maturity. This was 3 days later than Metropolitan and 3 days earlier than Stowell's Evergreen. The plants are about 1 foot shorter than those of Metropolitan, have much less tendency to tiller, and are colored with red more extensively on the tassel. The husks are slightly larger and more loosely wrapped, while the husked ears are about an inch shorter and about the same plumpness. This old variety is not grown to any extent today, having been replaced by other varieties. As is the case in many of the older sorts, the original stocks have disappeared.

Plant medium tall, $5\frac{1}{2}$ –6 feet; stalks moderately heavy and straight; nodes 10–12, covered, not prominent, slightly streaked with red at the base. Brace roots present, moderately useful and complete on one node. Tillers few, somewhat shorter than central stalk. Leaves moderately long and medium broad, 32 – $34 \times 3\frac{1}{4}$ –4 inches; sheath longer than internode. Tassel moderately long and heavy, 18–20 inches, coarse; terminal spike erect; lateral spikelets moderately erect, medium length, many present, crowded and branched at the base; bracts dark green, sparsely striped with pale red; anthers reddish bronze (terra cotta to vinaceous russet); 70–72 days to anthesis.

Ears borne at 4th and 5th nodes, very often two ears per stalk. Shank short and moderately slender, 2–3 inches. Husk leaves few and short. Husks moderately many, long, not tightly wrapped and rather easily removed. Husked ear medium long and moderately plump, 7 – $8 \times 1\frac{1}{8}$ –2 inches, slightly tapering, nearly cylindrical; base compressed; tip abruptly conical to rounded, slightly exposed; rows 12–14, moderately straight, occasionally irregular at the base.

Kernels at milk stage white, moderately large, broader than deep; at dry stage dull white, short, moderately broad, rather thin, $.9 \times 1.05 \times .38$ cm. (128 seeds per oz.); nearly square; crown rounded; surface abundantly but shallowly and finely wrinkled; set slightly loose on cob.

Sheffield. Refs. 28, 46, 78, 238, 241, 292, 403, 458, 459, 460, 517, 533. Syns. Earliest Sheffield, Early Sheffield, New Earliest Sheffield.

Sheffield was the name given to a variety of sweet corn arising as the result of a definitely planned cross made between Cory and Extra Early Adams. Dr. Van Fleet, who made the cross, was a well-known hybridizer and was after a new corn combining earliness with quality. W. Atlee Burpee secured seed of the hybrid and sent it to C. S. Clark, seed corn grower in Ohio, who wrote enthusiastically of its good qualities. "This 'Van Fleet' corn as you call it is 8- to 10-rowed; very distinct in shape, color and growth. Its great merit lies in the fact that it does not smut and this fact alone is worthy of introduction." Burpee offered it in 1899 as Sheffield and continued it in his catalog until 1915.

Plant tall, 7 – $7\frac{1}{2}$ feet; stalks moderately heavy and straight; nodes 12–13, nearly covered, not prominent. Brace roots present, moderately heavy, whorl complete on one node, useful. Tillers moderately many, equal to and occasionally slightly shorter than the central stalk. Leaves long and moderately broad, 34 – 36×4 –5 inches; sheath equal to and shorter than internode. Tassel moderately long and medium heavy, 18–20 inches, slightly streaked with red at the base; terminal spike erect; lateral spikelets horizontal

to slightly drooping, medium length, moderately many and crowded; bracts and anthers variable; 70–72 days to anthesis.

Ears borne at 5th to 7th nodes, one ear per stalk with an additional nubbin present. Shank short, 2–4 inches, and decidedly heavy. Husk leaves few, short and light. Husks many, rather heavy, medium length, rather tightly wrapped and difficult to remove. Husked ear moderately long and moderately plump, 8 – $9 \times 1\frac{1}{8}$ –2 inches, slightly tapering; base enlarged and compressed; tip conical and exposed; rows 12–14, moderately straight, slightly irregular at the base, crowded around the cob.

Kernels at milk stage white, rather small, narrow and medium depth; at dry stage opalescent white, longer than wide, medium thickness, $1.16 \times .90 \times .35$ cm. (108 seeds per oz.); triangular; crown slightly rounded; surface moderately and rather deeply wrinkled; set somewhat loosely on the cob.

Shoe Peg. Refs. 91, 126, 290, 328, 329, 335, 350, 368, 445, 510, 514, 533.

The original stock for this type of sweet corn is said to have been grown by a family in Bordentown, New Jersey, and held originally by them for many years prior to 1882. As a sequence to the several introductions made during the next few years, Johnson and Stokes of Philadelphia selected either from the original stock or from the Ne Plus Ultra, a slightly larger eared type which they called Shoe Peg. This they introduced and copyrighted in 1889. The new introduction was popular for a few years, but when the still larger eared Country Gentleman was offered in 1890 it supplanted all similar sorts. The names Shoe Peg and Ne Plus Ultra persist today but most strains selling under these names are now Country Gentleman. A stock secured from J. Bolgiano and tested at Geneva appeared to be earlier and with smaller cob and kernels. This was possibly a survival of the old type introduced by Johnson and Stokes.

Silver Bantam. Ref. 264. Illus. 63.

As the name would indicate, plants of Silver Bantam produce 8-rowed ears that greatly resemble ears of Golden Bantam in both quality and appearance. The variety is often called the "silver-hued twin" of Golden Bantam but such is true in name and appearance only, for Silver Bantam was not introduced until 1927. Peter Henderson & Co., the introducers, secured seed from John Ware of Plainfield, New Jersey.

The origin was accidental. Golden Bantam, Metropolitan, and Black Mexican were growing in the same garden plot and one ear of Golden Bantam that remained after the harvest contained 12 white grains. These were saved and planted the next year. Some black mixing also occurred but these dark seeds were not saved. The parents of this very attractive new variety apparently were the Metropolitan crossed on the Golden Bantam. After selection for 5 years it was inspected by the head gardener and manager from Henderson's and purchased on the spot. This was in 1923 and after still further selection it was introduced in 1927.

At Geneva edible ears were produced in 87 days, 9 days earlier than Best of All or White Bantam, in season with Crosby, and 5 days later than Market Gardener's Extra Early. Silver Bantam produces plants 1 to $1\frac{1}{2}$ feet shorter than those of Best of All, more

slender, and more consistently colored on the bracts. The husked ears are 2 to 3 inches shorter and about the same thickness, otherwise they are much alike. The resemblance to Golden Bantam in appearance, with the exception of color, is rather striking. Those who like the small-eared sorts in a mid-season variety will find in this variety something that will remind them of the regular Bantam so popular among the yellow varieties. It is not grown to any extent at the present time.

Plant moderately short, 4 $\frac{3}{4}$ –5 feet; stalks slender and moderately straight; nodes 7–8, exposed, prominent, shaded with red at the base. Brace roots present, slender, moderately useful and complete. Tillers many, slightly shorter than central stalk, often bear one good ear. Leaves moderately short and medium broad, 26–28 x 3 $\frac{3}{4}$ –4 inches, distinctly red at the margin; sheath shorter than internode. Tassel medium long and slender, 15–18 inches, somewhat feathery, streaked with red at the base; terminal spike moderately erect; lateral spikelets horizontal to slightly drooping, many, medium long and moderately crowded; bracts dark green, moderately striped with red; anthers buff (deep colonial buff to chamois); 60–63 days to anthesis.

Ears borne at 3rd and 4th nodes, one and occasionally two ears per stalk, one usually a nubbin. Shank medium long and slender. Husks medium in number, short, rather tightly wrapped, inner layer adheres to kernels, somewhat difficult to remove. Silk medium in amount and length, uniformly pale green in color, difficult to remove. Husked ear moderately short and slender, 6–7 x 1 $\frac{3}{8}$ –1 $\frac{1}{2}$ inches; moderately tapering; base slightly enlarged and occasionally open; tip long conical, usually exposed, but occasionally capped; rows 8, straight, occasionally paired, regular, attractive; furrows, when present, deep and very narrow.

Kernels at milk stage white, small, medium width and shallow; at dry stage opalescent white, slightly wider than long, medium thickness, .90 x 1.06 x .40 cm. (132 seeds per oz.), short oval in shape; crown semicircular; surface abundantly and finely crinkled and pitted, often very shallow; set tightly on cob.

Silver Coin. Refs. 97, 238, 322, 404, 513, 515. Syn. New Silver Coin.

This moderately late, vigorous grower was introduced by A. W. Livingston's Sons, Columbus, Ohio, in 1893. No information is available concerning its origin, but its similarity in many respects to Stowell's Evergreen leads one to suspect it to have been a selection from that variety. The plants were slender and about 7 feet tall, having ears 7 $\frac{1}{2}$ to 9 inches long containing 14 to 16 rows. The kernels were milky white, deeper than broad, deeply creased and wrinkled, and were reported to be of good quality and of delicate flavor. It was discontinued about 1906.

Snow Cream Table. Ref. 500. Syn. Snow Cream.

Lost or inadequate records on the part of many of the earlier seedsmen have made it impossible to ascertain in a great many instances the origin and history of many varieties, including this one. It was featured by Walter P. Stokes of Moorestown, New Jersey, at least as early as 1912 and continued to 1918. The descriptions and illustrations suggest a strong resemblance to Howling Mob, although no direct comparison is available. Reports indicate that the plants grew to a height of 6 or 7 feet and often produced two full-sized ears. The husked ears were 7 to 8 inches long, moderately plump and tapering, and possessed 12 to 14 rows of snow-white kernels.

Stabler's. Refs. 22, 61, 65, 89, 91, 93, 121, 125, 207, 208, 214, 238, 328, 329, 338, 350, 368, 397, 403, 405, 411, 487, 508, 510, 516, 533, 535, 537. Syns. Pedigree, Stabler's Early, Stabler's Early Sugar, Stabler's Extra Early, Stabler's Pedigree.

This variety, first introduced by W. Atlee Burpee in 1890, originated with Henry Stabler of Maryland who was also responsible for Roslyn Hybrid. Also listed by Thorburn, Johnson and Stokes, Dreer, Henderson, and others, it became rather a standard sort popular for several years because of its earliness and sweetness. By some it was considered to be similar to Shaker's Early and also to Early Cosmopolitan introduced later by Burpee. Its last listing was in 1919 by Thorburn.

Stark's Three-Ear. Refs. 345, 492. Syns. New 3-Ear, Three-Ear.

Introduced about 1928 by Stark Brothers of Louisiana, Missouri, this variety was rather short lived. Were it not for circumstances which resulted in the purchase of the seed stocks by W. Atlee Burpee, the variety would undoubtedly be in existence today. Three-Ear originated as a first-generation hybrid involving Moneymaker, the pistillate parent, and Stowell's Evergreen. It was reputed to have had great uniformity, exceptional vigor, and productiveness, often bearing three full-sized ears per plant. As grown at Geneva, more often one and two ears were produced, although occasionally a third ear did occur. Edible maturity was reached in 96 days.

Plant tall, 8–8 $\frac{1}{2}$ feet, stalks heavy and straight, tillers medium in number. Tassel moderately long, 18–20 inches with lateral spikelets long and horizontal. Ears borne at 5th, 6th, and 7th nodes, often two and occasionally 3 ears per stalk. Husked ear moderately long and moderately plump, 8–9 x 1 $\frac{3}{4}$ –1 $\frac{7}{8}$ inches, slightly to moderately tapering; rows 12–14, straight and attractive. Kernels white, medium size and moderately deep; at dry stage pale amber, triangular in shape, moderately wrinkled; set slightly loose on cob.

Stowell's Evergreen. Refs. 13, 14, 22, 24, 58, 61, 73, 74, 77, 87, 89, 91, 93, 94, 95, 96, 120, 121, 124, 126, 129, 175, 179, 189, 200, 207, 208, 235, 236, 238, 240, 241, 243, 255, 266, 270, 271, 274, 278, 295, 308, 316, 328, 329, 335, 343, 344, 350, 356, 367, 368, 397, 403, 404, 405, 408, 410, 411, 412, 414, 418, 422, 423, 435, 447, 448, 474, 478, 487, 491, 499, 503, 507, 508, 510, 511, 512, 513, 514, 515, 516, 517, 525, 532, 533, 535, 536, 537, 538, 544, 545, 546, 552, 562. Syns. Acme Evergreen, "Avon Evergreen," "De Wolf's Early Acme," Evergreen, Fancy Evergreen, Gold Coin Evergreen, Improved Evergreen, Improved Stowell's Evergreen, Kelly's Hybrid, Large Mammoth Evergreen, Late Mammoth Evergreen, Lead-All Evergreen, Mammoth Evergreen, New England Evergreen, Pedigree Stowell's Evergreen, Prosperity Evergreen, Stowell's, Stowell's Evergreen Sweet, Stowell's State Fair, Stowell's Sugar, Sugar Evergreen, Two-Eared Evergreen, White Cob Evergreen. Illus. 25.

Stowell's Evergreen is one of the oldest and most popular varieties of sweet corn in existence. The first

listing of the variety is not known, but the name Stowell's Evergreen was used, among others, in the catalogs of J. M. Thorburn & Co., 1856; Robert Buist, 1859; Hovey & Co., 1859; and R. H. Allen & Co., 1860. In some of the early catalogs the name Evergreen Sweet was used and lacking other evidence must be considered the same as Stowell's.

The first names added to the list published in 1848 by J. H. Salisbury were Darling's Early, Old Colony, and Stowell's Evergreen. The two latter varieties have had a very similar history.

Prof. Mapes of Newark, New Jersey, in the *Working Farmer* of 1850, gives the history as follows: "This corn is a hybrid between Menomony soft corn and the northern Sugar corn and was first grown by Mr. Nathan Stowell of Burlington, N. J. We purchased from Mr. S. a number of ears dried for seed and he presented us with a few ears surrounded by the husks, grown the previous summer, the inner leaves of the husks of which, and the corn and cob, were in as green a state as when pulled the previous August. Near the close of the late fair of the American institute, I presented the managers with two ears pulled in August 1849, and twelve ears pulled in August 1850. They were boiled and served up together and appeared to be alike, and equal to corn fresh from the garden."

At Geneva this old favorite came into production in 98 days, 1 day later than Country Gentleman, in season with Narrow Grained Evergreen, and 2 days earlier than Late Mammoth. The plants are much like those of Narrow Grained Evergreen, possibly slightly more slender, with more tendency to tiller and have somewhat darker green tassels. The husked ears are about the same size, more tapering, and contain 6 to 8 less rows of kernels. The kernels are decidedly broader and usually somewhat more irregular in appearance. In the dry stage the crown is distinctly converging, a character not present in most varieties. Stowell's Evergreen has long been one of the "old guard" in sweet corn collections. It is probably the most widely known and appreciated variety ever to be introduced and as such has been traditional among amateur and professional gardeners alike. All other late crop sweet corns have been and continue to be compared to it in respect to its many desirable qualities. It has been equally successful when used in the home garden, the market garden, and for the canning industry.

Plant tall, $7\frac{1}{2}$ -8 feet; stalks moderately heavy; nodes 12-14, usually exposed, prominent; brace roots present, moderately slender, complete on one node, useful. Tillers moderately many, somewhat shorter than central stalk. Leaves long and medium broad, $33-35 \times 3\frac{1}{4}-3\frac{3}{4}$ inches; sheath shorter than and occasionally equal to internode. Tassel moderately long and heavy, 18-20 inches; terminal spike erect; lateral spikelets horizontal to moderately erect, medium in number, long and somewhat crowded; bracts green, sparsely striped with red; anthers mostly dull yellow (chamois to old gold); 73-74 days to anthesis.

Ears borne at 5th and 6th nodes, one and occasionally two ears per stalk. Shank moderately long and heavy, 5-7 inches. Husks medium in number, moderately short, rather tightly wrapped. Silk pale red to amber, abundant, moderately long and easily removed. Husked ear moderately long and plump, $8-9 \times 2\frac{1}{4}-2\frac{1}{2}$

inches, slightly tapering; base enlarged and compressed; tip abruptly conical and slightly exposed; rows 16-18, straight, regular, crowded around the cob.

Kernels at milk stage silvery white, large, medium width and very deep; at dry stage opalescent white, large, moderately wide, long and thin, $1.44 \times .93 \times .32$ cm. (112 seeds per oz.), somewhat rectangular in shape; crown converging; surface exceedingly deep and coarsely wrinkled, irregularly crease dented; set very loose on cob.

Sunnyslope Special. Refs. 335, 495. Syn. Sunnyslope.

This variety was developed by Arthur L. Richie of Riverton, New Jersey, from a cross between Howling Mob and Floracraft Beauty. These varieties were planted in adjacent plots in a trial in 1911 and allowed to interpollinate. By 1916 a new strain coming from the cross was sufficiently fixed for inspection and a trial was arranged in which other early varieties grown for the Philadelphia market were planted. Several seedsmen saw this trial and were favorably impressed by the comparative earliness and size of the cross. The World War delayed its introduction except in a local way until 1924, when the Stokes Co. listed it as a second early variety, but discontinued it in 1927.

Surprise. Refs. 183, 304, 345, 348, 478. Syns. Early Honeysuckle, Early Surprise, Extra Early Surprise, Pioneer.

According to the *Descriptive Catalogue of Vegetables* issued by the Associated Seed Growers, New Haven, Connecticut, this variety was developed by them from Early Mayflower and introduced in 1927. It is quite possible that the stocks were offered a few years previously, for Early Surprise was listed by Fottler, Fiske and Rawson in 1925; by Breck and Fiske in 1926; and as Pioneer by Forbes in 1926. Early Honeysuckle, which was offered by Kendall and Whitney in 1922, also appeared to be much like present-day stocks of Surprise as sold by this company. Early Surprise is another variety which traces its parentage back to Mammoth White Cory which, in its type, stands back of all present-day, early, large-eared, white varieties.

At Geneva 77 days were required for this variety to reach edible maturity. This proved to be 2 days earlier than Pocohontas, 2 days later than Early Mayflower, and 3 days earlier than Mammoth White Cory. The plants are much the same as Pocohontas but less inclined to tiller. The ears have much shorter and lighter husk leaves and somewhat shorter husks, while the husked ears are slightly shorter. The resemblance of the two varieties is striking and except for minor differences can be considered as closely related. Surprise is used to a considerable extent in northeastern United States where it is grown successfully as a home and market garden sort.

Plant moderately short, $4\frac{1}{4}$ -5 feet; stalks slender, zigzag; nodes 7-9, exposed, prominent. Tillers few, much shorter than central stalk. Leaves moderately short and medium broad, $25-27 \times 3\frac{1}{2}-4$ inches; sheath shorter than internodes. Tassel moderately long and slender, 18-20 inches; terminal spike erect; lateral spikelets nearly erect, many, short and crowded; bracts green, sparsely striped with light red; anthers reddish bronze (terra cotta to vinaceous red); 56-58 days to anthesis.



VANGUARD

(Four-fifths natural size)



WHIPPLE'S EARLY WHITE

(Four-fifths natural size)

Ears borne 2nd and 3rd nodes, one ear per stalk with an additional nubbin usually present. Husks thick, short, rather tightly wrapped, easily removed. Husked ear moderately short and moderately plump, 6-7 x $1\frac{3}{4}$ -2 inches; moderately tapering; base slightly enlarged and compressed; tip abruptly conical and slightly exposed; rows 10-12, moderately straight, occasionally somewhat irregular near the apex, crowded around cob.

Kernels at milk stage white, moderately large, wide and thick; at dry stage dull creamy white, medium size, short, medium wide and thick, .87 x 1.0 x .40 cm. (120 seeds per oz.); short oval to somewhat triangular in shape; crown moderately rounded; surface very sparsely and coarsely wrinkled; set tightly on cob.

Sweetheart. Ref. 266.

This sort was introduced in 1918 by the Holmes Seed Co. of Harrisburg, Pennsylvania. Although the name had been used in 1912 by the Germaine Seed and Plant Company of Los Angeles, it was used with reference to another variety, the name of which they saw fit to change to Sweetheart. Holmes' Sweetheart is "the outcome of a selection from both Evergreen and Country Gentleman, and then crossed again with a variety named French Honey, retaining the sweetness of the latter and the depth and breadth of kernel of the former varieties."

The plants were reputed to grow 7 to 9 feet and produce two, three, and occasionally four ears per plant. The ears were 8 to 9 inches long and possessed 12 rows of broad deep kernels. The variety was short lived, having been discontinued prior to 1923.

Sweet Squaw. Ref. 335.

Sweet Squaw resulted from a cross made by Arthur J. Logsdail at the Central Experimental Farm at Ottawa, Canada, in 1913 between White Squaw, a flint corn as grown by the Mandan Indians of Dakota and Manitoba, and Early Malakhoff. After selections from this cross had been made and given a rather thorough trial, the best was named Sweet Squaw in 1917. The variety has become popular in some of the prairie provinces of Canada. The average length of ears is 6 inches with 12 rows to the ear.

Tom Thumb. Refs. 14, 22, 61, 89, 90, 91, 122, 214, 407, 507, 508, 535, 537, 538. Syns. Early Tom Thumb, Extra Early Tom Thumb.

Tom Thumb first became known about 1865 when it was used locally in New Jersey as the earliest sort that could be grown for the New York market. As then known, it represented an improvement in size of ear over Darling's Early, long the standard early sweet corn. Price of Albany in 1874 was one of the first to list Tom Thumb, and although this listing was followed by others, it never became a variety of first importance.

Plant moderately short, $3\frac{1}{2}$ -5 feet; stalks slender. Foliage scanty. Tassel slender, laterals few, slender and drooping. Ears borne low, 10-12 inches from the ground. Dry ear short and slender, $4\frac{1}{2}$ -6 x $1\frac{3}{8}$ - $1\frac{1}{2}$ inches; nearly cylindrical; tip abruptly tapering to rounded; rows 8, regular, pairs only distinct at the base; cob white. Kernel at dry state whitish amber, wider than long (116 seeds per oz.); crown rounded; surface rather heavily wrinkled.

Triumph. Refs. 15, 22, 61, 73, 74, 89, 91, 93, 121, 126, 168, 214, 238, 241, 403, 405, 411, 423, 428, 435, 503, 507, 508, 509, 515, 517, 533, 535, 536, 537, 538, 545. Syns. Improved Triumph, New Triumph, Triumph Sugar, Triumph Sweet.

This sweet corn was first brought out by D. C. Voorhees of Blawenburg, New Jersey. A single trial ground test made by the *Rural New-Yorker* in 1874 was so favorable that the agnomen "tip-top" suggested itself to the editor for his report. No definite record is available of the origin of Triumph, and since at the time of its introduction no other sweet corn even closely resembled it, it was said to have come into existence as the result of chance crossing. The variety became the precursor of the many slender long-eared varieties which, although never of first importance, have been known for their sweetness and for the attractive appearance of the ear.

Plant tall, 6-7 feet; stalks heavy and vigorous. Tillers few. Tassels heavy. Ears borne 24-30 inches from the ground, one and often two ears per stalk. Husk leaves many, medium long. Dry ears moderately long and moderately slender, 8-9 x $1\frac{1}{2}$ - $1\frac{5}{8}$ inches, distinctly tapering; base enlarged and often open; tip usually rounded; rows 8-10, often distinctly paired at the base, straight, regular. Kernels at dry stage whitish amber, short, thick, broader than long (107 seeds per oz.); crown nearly flattened; surface moderately wrinkled.

Vanguard. Refs. 335, 344, 348, 496. Syn. Earliest Ever. Illus. 66.

Always on the alert to find or develop an earlier sweet corn, Arthur L. Richie, in 1917, planted alternate rows of his new Sunnyslope Special with Dreer's Aristocrat, detasseling one row to insure crossing. By saving seed from this row and planting it the next year, he obtained a mixture of white, pinkish, and red seeds. The white seeds only were saved for future planting, and in a few years a pure strain became fixed which proved to be superior to the parent variety Sunnyslope Special. This was followed by careful ear-to-row selection, and as a reward for his perseverance he eventually developed another winner. Richie sold seed of this locally under the name Earliest Ever which name Francis C. Stokes & Co., Inc., changed to Vanguard at the time of its introduction in 1926.

At Geneva, 81 days were necessary to produce edible ears of this variety, which was a week earlier than Howling Mob, about the same season as Whipple's Early, and 5 days later than Alpha. Vanguard produces plants the same height as those of Howling Mob, has much less tendency to tiller, and is usually without the red streaking present on the latter. The ears are borne much farther away from the stalk and at a more obtuse angle than those of Howling Mob and have husk leaves that are distinctly shorter and lighter. The husked ears are of equal length, about the same thickness and have two to four less rows and correspondingly wider kernels than those of Howling Mob. The variety has achieved greatest importance as a home and market garden sort.

Plant moderately tall, 6-7 feet; stalk moderately heavy, slightly zigzag; nodes 10-11, somewhat exposed, moderately prominent. Brace roots present, moderately heavy, whorl complete on one node, useful. Tillers few present, much shorter than central stalk. Leaves medium long and medium broad, 30-32 x $4\frac{1}{4}$ - $4\frac{1}{2}$ inches; sheath slightly shorter than internode. Tassel medium long, 16-18 inches, rather coarse and occasionally colored at the base; terminal spike erect; lateral spikelets slightly drooping, moderately many, crowded and moderately long; bracts green,

slightly striped with red; anthers light reddish bronze (terra cotta to vinaceous russet); 60-62 days to anthesis.

Ears borne at 4th and 5th nodes, well away from main stalk at a rather wide angle, one and occasionally two ears per stalk. Husks many, thick, short, tightly wrapped, not easily removed. Husk leaves extremely small and light, usually perpendicular to the ear. Husked ear moderately long and plump, 8-9 x 2-2½ inches; moderately tapering; base enlarged; tip conical and exposed; rows 10-12, occasionally paired, moderately straight, slightly irregular at base.

Kernels at milk stage white, moderately small, shallow and medium width; at dry stage opalescent white, medium size, short, moderately wide and thick; 1.0 x 1.01 x .4 cm. (100 seeds per oz.), oval in shape; crown rounded; surface rather abundantly but shallowly wrinkled; set on cob tightly.

Voorhees Red. Refs. 237, 403, 461.

One of the many plant breeding projects carried out by Byron D. Halstead, botanist and horticulturist at the New Jersey Agricultural Experiment Station at the beginning of the present century, was one to improve the varieties of sweet corn existing at that time. A cross between Black Mexican and Egyptian was made in 1899, and in 1903 a new type was selected which seemed to have considerable promise. The variety was named Voorhees Red for Edward B. Voorhees, then Director of the New Jersey Station. This new type of sweet corn was the result of a cross between a black and a white variety and produced ears of a beautiful pink when picked for cooking, and with red kernels when mature. Prof. Halstead got the usual parti-colored result in the seed grains, ranging from light pink and rose to dark red and black purple. As served on the table there was scarcely a hint of its Mexican parentage except its sweet and tender qualities. The distribution of the seed was made to any who wished samples and for a time it was quite popular as a midseason variety. The Ford Seed Company of Ravenna, Ohio, offered it in 1906 in trial packets of ten kernels each.

Plant medium tall, 5-6 feet; stalks heavy; usually two ears per stalk, occasionally an additional nubbin present. Husked ear medium long, 7-8 inches; nearly cylindrical, slightly tapering; rows 10-12, straight and regular. Kernels at milk stage white to pale pink, shallow, fairly broad and thick; at dry stage red; short oval in shape; surface moderately, uniformly wrinkled.

Western Queen. Refs. 109, 178, 406.

This variety originated with H. C. Cummings of Oklahoma who offered it as the result of a cross involving Country Gentleman and King Phillip, a well-known field corn. So far as can be determined, John Lewis Childs of Floral Park, New York, was the first large seed house to list it, the introduction occurring in 1905. Very shortly afterwards it was included among Henry Fields collection as a pink strain of Country Gentleman. There is on record one trial carried out at the New Hampshire Experiment Station, the seed of which was obtained from Childs. Reports indicate that the variety was an extremely vigorous grower often attaining a height of 10 and 11 feet. The ears were larger than those of Country Gentleman, had deeper grains, apparently equal in quality but later in season. The kernels in the milk stage were ivory white, but when mature they assumed a pink cast.

This variety should not be confused with Shumway's Western Queen, a record of which exists in Sturtevant's publication (508) as well as Burrill and McClure's (91). This stock was apparently synonymous with Pee and Kay.

Whipple's Early White. Refs. 247, 335, 345, 346, 348, 478. Syn. Whipple Early. Illus. 25, 67.

Introduced in 1919 by the Joseph Harris Co. of Coldwater, New York, Whipple's Early White quickly became an important variety in New York State. If it were not for the lessened interest in the white varieties and the growing importance of the yellow sorts, Whipple's Early White would undoubtedly be considered one of the leading and outstanding market varieties of modern times. Silas S. Whipple of Norwich, Connecticut, was the originator, and the excellence of present-day stocks is to a large degree the result of his continued interest in the variety.

Mr. Whipple secured seed of an unknown sort in 1910 from one of his customers. Mr. Greiner, the German gardener on a neighboring estate, had given a quantity of eating corn to this customer, and she having a surplus passed some old ears on to Mr. Whipple with the injunction "take them home and plant them and they will make you rich." The first year's corn from this seed was ready for picking just after Crosby and before Evergreen and had 8, 10, and sometimes 12 rows of kernels on ears about a foot long. Changes in Whipple's Early White have been considerable since this first trial as present-day stocks show 14 to 18 rows. The length of the ear was shortened by selection to fit the length of the side dishes of the Wauregan Hotel, one of Mr. Whipple's principal customers.

Whipple's Early White produced edible ears in 80 days at Geneva, practically the same season as Vanguard, 4 days earlier than Kendel's Early Giant, and 5 days later than Early Mayflower. The plants are about the same height as those of Vanguard, having longer tassels and anthers more variable in color. The ears are borne much closer to the stalks and have longer and more loosely wrapped husks. The husked ears are slightly shorter, more cylindrical, and have four to six more rows with correspondingly more narrow and decidedly deeper kernels. Whipple's Early White has enjoyed wide popularity as a home and market garden variety.

Plant moderately tall, 6-6¾ feet, vigorous; stalk moderately heavy, straight; nodes 8-10, prominent. Brace roots present on one node, moderately heavy, whorl complete, useful. Tillers, few present, slightly shorter than central stalk. Leaves moderately long and medium broad, 32-35 x 3¼-4 inches; sheath shorter than internode. Tassel moderately long and slender, 18-20 inches; terminal spike erect; lateral spikelets slightly drooping, moderately many, long, branched and rather scattered; bracts green, slightly striped with light red; anthers variable in color; 60-62 days to anthesis.

Ears borne at 3rd and 4th nodes, one and often two ears per stalk, one occasionally a nubbin. Shank moderately long, 4-6 inches, moderately heavy but brittle. Husks many, quite heavy, rather loosely wrapped and easily removed. Husk leaves many, short, quite stiff and heavy, much darker green in color than husk. Husked ear medium long and moderately plump, 7-8 x 1⅞-2 inches; partly cylindrical, moderately tapering; base enlarged and compressed; tip

abruptly conical and occasionally capped; rows 14-18, quite regular, but occasionally somewhat twisted and irregular at the apex, spiral arrangement evident in some instances, crowded around the cob.

Kernels at milk stage white, moderately narrow, shallow and thick; at dry stage dull white; medium size, moderately long, narrow, and decidedly thick, $1.04 \times .83 \times .45$ cm. (100 seeds per oz.); oblong or nearly rectangular in shape; crown nearly straight; surface very irregular with deep and abundant wrinkling; loosely set on cob.

White Cob Marblehead. Refs. 169, 438, 477, 510, 535. Syns. Early White Cob Marblehead, Extra Early Marblehead, Extra Early White Marblehead, Harbinger White Marblehead.

For those who objected to the red cob of Narragansett and Marblehead, this new selection was offered by J. J. H. Gregory in 1885. It came about by selection from Marblehead of the purest white ears by Mr. Gregory and resulted in a strain almost uniformly white, both cob and kernel. This whiteness, however, was gained at the expense of a slight decrease in earliness. The variety was widely listed, but since Cory was earlier it never became a leading variety.

White Cory. Refs. 20, 74, 101, 121, 163, 207, 208, 220, 221, 238, 240, 241, 262, 275, 298, 335, 345, 367, 368, 405, 412, 450, 454, 478, 498, 508, 509, 512, 514, 515, 516, 518, 525, 533, 546. Syns. Astor, Carter's Improved, Early White Cory, Extra Early White Cory, First Crop, First Crop Sugar, New Extra Early White Cory, New White Cob Cory, White Cob Cory, White Cob Early Cory.

In a general description of Cory given in the catalog of D. M. Ferry & Co. for 1893 is the key to the interest placed by seedsmen in finding white cob selections of the several important varieties of sweet corn having a red color, such as Narragansett, Marblehead, and Cory. "All the red cobbled corns should be cooked quickly by dropping the ears into boiling water to which a little salt has been added, for if simmered over a slow fire, or allowed to stand in the water after cooking, the red cob will discolor the kernels."

White Cory was first introduced by D. M. Ferry & Co., in 1892, after several years selection. When introduced the selection was not entirely free from red cobs, but the proportion of white to red seemed sufficient to justify offering it to growers. This strain was quickly taken up by other seedsmen and after a few years it practically displaced Red Cob Cory.

Eighty-eight days were required for White Cory to produce edible ears at Geneva. This proved to be 3 days later than Red Cory, about the same season as Early Sweet or Sugar, and 2 days earlier than Mimm's Hybrid. The variety produces plants that are 1 foot taller than those of Red Cory, more consistently tillered, and have longer tassels that are less streaked with red at the base. The husked ears are slightly longer, more cylindrical, and more uniformly 8-rowed.

Plant medium tall, 5-6 feet; stalk medium slender and straight; nodes 9-10, slightly exposed, occasionally somewhat prominent; internodes moderately streaked with pale red on exposed surfaces. Brace roots occasionally present, slender, not very useful. Tillers moderately many, slightly shorter than central

stalk. Leaves medium long and medium broad, $28-30 \times 3\frac{1}{2}-3\frac{3}{4}$ inches; sheath usually equal to but occasionally shorter than internode. Tassel moderately long and slender, 18-20 inches, not colored at the base; terminal spike erect; lateral spikelets horizontal to slightly drooping, many, moderately long, and moderately crowded; bracts green, sparsely striped with pale red; anthers variable in color; 63-65 days to anthesis.

Ears borne at 3rd and 4th nodes, one and occasionally two ears per stalk. Shank medium long, 3-5 inches, moderately slender and brittle. Husks medium number and length, rather tightly wrapped, not easily removed. Husked ear medium long and slender, $7-8 \times 1\frac{3}{8}-1\frac{5}{8}$ inches, slightly tapering; base slightly enlarged, often open; tip long, conical and exposed; rows 8, regular, straight, often noticeably paired; furrows deep and moderately wide.

Kernels at milk stage white, medium width, rather shallow and thin; at the dry stage dull white, moderately small, much wider than long, $.86 \times 1.1 \times .39$ cm. (112 seeds per oz.); short broad oval in shape; crown distinctly rounded; surface sparsely and shallowly wrinkled; set tightly on cob.

White Evergreen. Refs. 12, 42, 79, 158, 238, 241, 335, 372, 403, 406, 460. Syns. Early White Evergreen, New Snow White Evergreen, New White Evergreen, Snow White Evergreen.

The Burpee White Evergreen, introduced in 1903 by W. Atlee Burpee, originated from one pure white ear of Stowell's Evergreen found by C. S. Clark of Wakeman, Ohio. After 5 years of careful work, seed was offered to Burpee and it became one of the important introductions of the new century. The attempt was made to get a strain with heavy light green silk and tassel, but about 20 per cent of the plants showed dark in the floral organs.

The cob and kernels at all stages of edibility were beautifully white, elimination of the amber tint being of great value, especially to canners. The plant was robust and the ears large, in fact for serving on the cob they were considered by some to be too large. The young ears remained in edible condition for a long time and when two or more were produced on a stalk they came in succession thus lengthening the season for a given planting. The variety has been offered continuously at least to 1926, but has had only short periods of popularity.

White Mexican. Refs. 132, 238, 241, 303, 378, 403, 533. Syns. Early Vacaville, Early White Mexican.

White Mexican, originated by G. H. Cummings, as a variety name has been known since 1906, when it was offered as a novelty by Vaughan Seed Store of Chicago, Illinois. Most listings found have been from seed companies of the Middle West where the variety has attained some popularity. The name itself would indicate relationship to the popular Black Mexican and there are several citations of this relationship, among them the following: Michael, 1916, "originated at Sioux City, a bud propagation of old Black Mexican;" Darling and Beaham, 1908, "several years ago some white kernels were discovered on a cob of Black Mexican." As grown at Geneva during the last few years a close resemblance of the various stocks was noted to Silver Bantam and Market Gardener's Extra Early. This indicated mixed stocks as well as confusion as to the actual type.

There are few published descriptions, but that given in Price and Drinkard (403) published in 1908 should be that of the variety as introduced.

Plant short, $3\frac{1}{2}$ –4 feet; stalk slender and straight; nodes 7–8, slightly exposed. Ears borne at 2nd and 3rd nodes, short and slender $6-7 \times 1\frac{3}{8}-1\frac{1}{2}$ inches, slightly tapering; rows 8–10, rather uneven. Kernels at milk stage white, broad and shallow; at dry stage amber white, broader than long and moderately wrinkled over the surface of the crown.

White Sunrise. Ref. 317.

This is a companion variety or twin to Golden Sunrise, both having come through the same parentage, a cross between Golden Bantam and Long Island Beauty. The cross was made by H. S. Mills in 1925 on the Long Island Vegetable Research Farm at Riverhead, New York. Selection for type was made in 1926 and continuously thereafter, until 1928 when Mr. Mills was employed by the D. Landreth Seed Co. By permission of Cornell University the stock seed was moved to Bristol, Pennsylvania, where further selection work was carried out culminating in the introduction of the variety by Landreth in 1932.

At Geneva 90 days were required to produce edible ears. This was 2 days earlier than Metropolitan, in season with Mimm's Hybrid, and 2 days later than Howling Mob. Mill's White Sunrise produced plants about 1 foot taller than those of Mimm's Hybrid, decidedly heavier, and with tassels 4 to 6 inches shorter. The husked ears are slightly shorter, of equal plumpness, and distinctly more tapering and exposed at the tip. This is one of the more recently introduced varieties and as such cannot be adequately judged at this time. Its vigor and size of ear indicate possibilities as a desirable main-season sweet corn.

Plant tall, $7-7\frac{3}{4}$ feet; stalks heavy and straight; nodes 11–12, exposed and prominent, internodes streaked with red on exposed surfaces. Brace roots present, heavy and useful, whorl complete on one and often two nodes. Tillers moderately many, slightly shorter than central stalk. Leaves medium long and medium broad, $30-32 \times 3\frac{1}{2}-4\frac{1}{2}$ inches; sheath shorter than internode. Tassel moderately long and heavy, 18–20 inches, rather coarse, slightly streaked with red at the base, terminal spike moderately erect; lateral spikelets horizontal to slightly drooping, many present, moderately long, multi-branched and rather crowded; bracts green, sparsely striped with rather pale red; anthers usually buff (warm

buff to chamois) but occasionally pale reddish bronze (terra cotta); 65–70 days to anthesis.

Ears borne at 4th and 5th nodes, one and occasionally two ears per stalk, one occasionally a nubbin. Shank moderately short and slender, 2–4 inches. Husks moderately many, heavy, short and tightly wrapped. Husked ear moderately long and moderately plump, $8-9 \times 1\frac{5}{8}-2$ inches, slightly tapering; base slightly enlarged and compressed; tip conical and exposed; rows 12–14, moderately straight, slightly irregular at the base and crowded around the cob.

Kernels at milk stage white, medium size, moderately narrow and rather deep; at dry stage dull white, $1.09 \times .94 \times .39$ cm. (128 seeds per oz.); somewhat triangular in shape; crown slightly rounded; surface abundantly and rather deeply wrinkled; set moderately loose on cob.

Wonder of the Market. Ref. 322.

No information concerning the origin of this sort is available. It had its beginning with C. J. Lindholm of Minneapolis, Minnesota, who also introduced it sometime prior to 1922. As grown at Geneva the plants were very small, averaging 3 to $3\frac{1}{2}$ feet in height, very slender, and nearly devoid of tillers. The ears were borne at the third and fourth nodes, one and occasionally two being present. These were short and plump, $5\frac{1}{2}$ to $6 \times 1\frac{5}{8}$ to $1\frac{3}{4}$ inches, possessing 12 to 14 rows of rather broad, thick kernels. In some respects this resembled Early Market, being smaller in both plants and ears as well as slightly later in season. Inasmuch as the variety was discontinued in 1930, only one season's notes of value were obtained.

Zig Zag Evergreen. Refs. 90, 97, 238, 328, 329, 350, 382, 403, 404, 533. Syn. Shoe Peg Evergreen.

This broken-row type of Evergreen corn was introduced in 1893 by Northrup, Braslan & Goodwin Co., Minneapolis, Minnesota. Gregory of Marblehead, Massachusetts, also offered it in 1896 as a novelty distinguishable by "the kernels which usually run zigzag down the cob, whence its name." Its resemblance to Country Gentleman was noted in early descriptions, the ears being larger, sweeter, earlier, and maturing over a longer period.

Jerome B. Rice Seed Co., Cambridge, New York, list Zig Zag Evergreen today as a selection from Stowell's Evergreen with ears densely covered with narrower, deep, sweet, white grain, without rows. The size of ear and season are the same as Stowell's Evergreen; the quality is fine.

THE YELLOW-KERNELED VARIETIES OF SWEET CORN

The varieties included in the group of yellow-kerneled sweet corns are united by the one character, color of kernel, otherwise there is no distinct or constant character which is common to the group. Up to the time the kernels on the ear begin to show this color differentiation, white or yellow, there does not seem to be any single character or correlated group of characters which allow even a preliminary separation into the white-kerneled or yellow-kerneled groups.

For 70 years after sweet corn was considered as a valuable food plant for the garden, the white-kerneled varieties predominated. At the beginning of the present century there were a few yellow varieties known,

Gold Nugget and Gold Coin being listed in the catalogs of most seed houses. However, the majority of those who considered themselves good judges as to what constituted the best quality sweet corn placed the yellow-seeded sorts in the category with horse corn or chicken corn. But in 1902 W. Atlee Burpee named and introduced Golden Bantam. Its use made friends, and consumer preference for yellow varieties began at that time.

Golden Bantam helped to break down prejudice against any yellow corn. As a result there has been a steady increase in yellow varieties comparable to the earlier increase in the white varieties. In some sections

and on some markets the preference for yellow varieties today amounts to nearly complete exclusion of white varieties. However, there are many who prefer the white varieties and there will continue to be many excellent sorts that can compete successfully with their yellow cousins in growth, yield, attractiveness of ear, and quality. Over 150 named yellow sorts were grown and studied for this work and 48 have been considered distinct and given at least a brief description.

As the number of white varieties increased, so also did the types or forms increase. This same increase in forms is noted for the yellow corns, and while it is true that there are certain types of white sweet corn that as yet do not have their counterpart in a yellow-kerneled variety, yet with each succeeding decade and as the number of varieties increases, we find individual yellow varieties able to match in size, appearance, season, quality, etc., similar varieties among the whites.

THE YELLOW VARIETIES OF SWEET CORN

Bantam Evergreen. Refs. 31, 117, 136, 150, 191, 192, 209, 335, 345, 357, 492, 525, 562. Syns. Delicious Bantam, Early Golden Sugar, Golden Evergreen, Golden Giant Evergreen, "Golden Rod," "Golden Sugar," Golden Sunburst, Jumbo Gold. Illus. 25.

Frederick B. Clark of the Everett B. Clark Seed Co., Milford, Connecticut, planted seed of Golden Bantam throughout a field of Stowell's Evergreen. The cross-pollination was continued for several generations until the dominant golden color became fixed. Selections were made over a period of 6 years and a new type chosen with the color and quality of the Golden Bantam and the kernel pattern and size of Stowell's Evergreen. It was ready in 1910, but was not popularized until 1913 when the Vaughan Seed Store of Chicago, Illinois, featured the new introduction as Bantam Evergreen. Since that time it has had wide distribution and has been freely recommended and widely cultivated as a large-eared yellow corn. In some sections it is known as Golden Evergreen, a name first used about 1915.

By some, Golden Evergreen is thought to have had an origin independent of Bantam Evergreen. One strain was introduced in 1917 by Beckert's Seed Store of Pittsburgh. This came from a cross of Golden Bantam and White Evergreen. Charles Coolidge of Phelps, New York, crossed Stowell's Evergreen and Sweet Orange just previous to the introduction of Bantam Evergreen. This strain was introduced in 1922 by F. H. Ebeling of Syracuse, New York. It has been impossible to distinguish the two on the basis of true separatory characters and early descriptions do not give a clear picture.

Ninety days were required to reach edible maturity at Geneva. This proved to be 10 days to 2 weeks later than Golden Bantam and 10 to 15 days earlier than Papago Sweet. With the exception of Papago, which is of no importance in New York State, Bantam Evergreen is accepted as the most important late yellow variety. It is used to some extent by the canning industry, but has achieved its greatest importance as a

large-eared late yellow of comparatively high quality, appearing on the market when most other yellows (planted in the normal season) are over-mature. Many of the fine qualities of Stowell's Evergreen have been retained in addition to the presence of yellow kernels. The plants are very vigorous, stout growers, similar to Golden Sunrise in this respect. Bantam Evergreen is more inclined to tiller than Golden Sunrise and produces kernels that in the dry stage are decidedly more deeply and abundantly wrinkled and set more loosely on the cob.

Plant tall, $6\frac{1}{2}$ - $7\frac{1}{2}$ feet; stalks heavy and straight; nodes 10-12, exposed, prominent. Brace roots present and complete on one and occasionally two nodes, heavy and useful. Tillers moderately many, slightly shorter and occasionally equal to central stalk. Leaves moderately long and moderately broad, $30-32 \times 3\frac{1}{2}-4$ inches; sheath shorter than and occasionally equal to the internode. Tassel long and heavy, 20-22 inches; terminal spike erect, lateral spikelets horizontal to slightly drooping, long, medium in number and evenly distributed; bracts green, rather heavily striped with red; anthers light reddish bronze (terra cotta); 64-66 days to anthesis.

Ears borne at 5th to 7th nodes, one and very often two ears per stalk with an occasional nubbin present. Shank medium long, 3-4 inches, moderately slender and brittle. Husks moderately heavy and medium in length. Husked ear moderately long and plump $8-9 \times 1\frac{3}{4}-2$ inches, moderately tapering; base enlarged and compressed; tip conical and slightly exposed; rows 12-14, moderately straight, somewhat irregular at the base, crowded around the cob.

Kernels at milk stage yellow, large, moderately broad and deep; at dry stage deep amber yellow, much longer than broad, comparatively thin, $1.22 \times .96 \times .31$ cm. (100 seeds per oz.); roughly triangular in shape; crown converging, somewhat angular; surface distinctly creased and very deeply and abundantly wrinkled; set very loosely on cob.

Banting. Refs. 298, 333, 334, 335, 345, 346, 347, 348. Illus. 25.

The climate in the prairie provinces of Canada and in the northern sections of nearly all provinces is relatively cool for sweet corn. Because of the importance of sweet corn as a food plant, the Central Experimental Farm at Ottawa grew in trials all varieties of early corn obtainable and in 1920 introduced Pickaninny which originated from a cross between two of the earliest in the trials.

The same year, Isabella Preston crossed Pickaninny with Howe's Alberta Flint, a very uniform, 8-rowed, yellow coming from the School of Agriculture, Edmonton, Alberta. In 1923, after 3 years of careful work by M. B. Davis and T. F. Ritchie, this yellow selection was sent out for trial as Banting. It was the first yellow sweet corn to compare in season with Pickaninny and the Squaw corn varieties.

Edible ears were secured in 65 days, which was 12 days to 2 weeks earlier than Golden Bantam and 3 to 4 days later than Golden Gem and Spanish Gold. Its value has been chiefly attributed to its earliness. The ears are considered too small, however, to be of great importance as a market garden variety in New York. The plants of this variety are more vigorous and will average 1 foot taller than Golden Gem. Likewise, the ear shanks are longer with husks and husk leaves longer and more abundant. The husked ears are slightly more slender, while the kernels in the dry stage are considerably deeper yellow in color.

Plant moderately short, $4\frac{1}{2}$ –5 feet; stalks slender and moderately straight; nodes 7–8, covered, not prominent. Brace roots and tillers usually absent. Leaves moderately short and narrow, $25\text{--}27 \times 2\frac{1}{2}\text{--}3\frac{1}{2}$ inches; sheath longer than and occasionally equal to internode. Tassel short and slender, 12–15 inches; terminal spike erect; lateral spikelets nearly erect, few, short and scattered; bracts and anthers variable in color; 48–50 days to anthesis.

Ears borne at 2nd and 3rd nodes, one and occasionally two ears per stalk. Shank medium in length, 3–4 inches, slender. Husk leaves many, long and heavy; husks few, rather short and wrapped moderately tight. Husked ear moderately short and slender, $6\text{--}7 \times 1\frac{3}{8}\text{--}1\frac{1}{2}$ inches, nearly cylindrical, slightly tapering; base compressed and tip conical, occasionally capped; rows 8–10, regular, straight, occasionally paired on 8-rowed specimens.

Kernels at milk stage yellow, moderately small and distinctly shallow; at dry stage bright, orange-yellow, moderately broad and short, $.86 \times 1.05 \times .37$ cm. (135 seeds per oz.); broad oval in shape; crown rounded; surface abundantly but rather shallowly wrinkled; set moderately tight on cob.

Burbank. Refs. 68, 69, 112, 335, 348, 492, 562. Syn. Burbank Bantam.

Luther Burbank, for whom this variety was named, at one time was a market gardener depending largely on producing his crops earlier than his neighbors. Living at Lunenburg, Massachusetts, and marketing most of his produce at Fitchburg, he experimented with various cultural practices and later with crossing in order to obtain an earlier and larger eared sweet corn. The crosses were made between 1870 and 1875, at which time he says, "the varieties Black Mexican, common sweet corn, and New England Yellow field corn were used." Nothing of promise was noted. Later from a cross between Early Minnesota and a yellow field corn some yellow hybrids were produced which retained the character of sweetness. Before these characters could be thoroughly fixed Burbank moved to California where the pressure of other work necessitated the curtailment of his corn breeding experiments.

It is quite probable that after the turn of the century Burbank again experimented with sweet corn and that the variety first distributed as a "New Bantam" came from a series of crosses. The Burbank catalog of 1921 in announcing the variety as "Burbank" states that there were 16 years of careful selection work before its introduction or naming. The variety has not made progress in the listings of popular varieties, and where 10 years ago it was commonly found, it is seldom offered today.

Edible ears were produced in 81 days, 2 to 3 days later than Golden Bantam, but ordinarily it can be considered in the same season. The variety is used to some extent by canners and also by market gardeners whose trade requires an ear with more rows than regular Bantam and which will retain much of the quality. The variety most resembles the 10- to 14-rowed Golden Bantam, although the number of rows per ear will average greater. The stalks are usually heavier, slightly shorter, and less inclined to tiller. Ears are slightly plumper, contain a greater number of rows, and are more abruptly tapered at the tip.

Plant moderately short, $4\frac{1}{2}$ –5 feet; stalks coarse, moderately heavy and straight; nodes 8–10, covered, not prominent. Tillers few, much shorter than central stalk. Leaves medium long and

narrow, $28\text{--}30 \times 2\frac{3}{4}\text{--}3\frac{1}{2}$ inches; sheath longer than and occasionally equal to the internode. Tassel short and slender, 12–15 inches; terminal spike erect; lateral spikelets nearly erect, medium length, moderately many, and crowded; bracts green, moderately striped with red; anthers light reddish brown (terra cotta); 62–64 days to anthesis.

Ears borne at 3rd and 4th nodes, one and occasionally two ears per stalk. Shank short, 2–3 inches, brittle. Husk leaves few and short; husks moderately few, heavy and short. Husked ear medium long and plump, $7\text{--}8 \times 1\frac{3}{4}\text{--}2$ inches, moderately tapering and partly cylindrical; base slightly enlarged and compressed; tip abruptly conical; rows 12–16, moderately straight but often distinctly irregular at the base, crowded around the cob.

Kernels at the milk stage light orange yellow, medium width and depth; at dry stage dull yellow, medium size, slightly broader than long, $1.0 \times 1.1 \times .35$ cm. (104 seeds per oz.); roughly triangular in shape; crown slightly rounded; surface moderately wrinkled, often rather shallow; set slightly loose on cob.

Burpee. Refs. 84, 298, 345, 346, 348, 475, 534. Syn. Earliest Yellow, Golden Pacific, Tangerine.

This is one variety that did not originate in or near New England, the cradle of sweet corn varieties. In fact, it was near the little town of Nooksack located within a few miles of the very northeast corner of the state of Washington that George G. Shelton began his experiment that led in 1927 to the introduction of Burpee. Mr. Shelton in 1917 planted some hills of Metropolitan next to a dent corn called Bloody Butcher. This is described in Ebeling's catalog as with stalks medium in height, fairly heavy, ears with 14 rows, color of kernel a deep cherry red with white cap. A further note says "worms and birds do not bother Bloody Butcher very much and for that reason it is much sought after by the southern planter." At harvest time some of the ears of the field variety were kept for seed. On one ear there were 10 or 12 grains of sweet corn. These were planted the following year next to some Golden Bantam. Only two stalks grew and one of these developed two ears of a chocolate color. The next year in 1919, seed from the ears were planted in two short rows adjacent to Golden Bantam and again crossing occurred. The plants of the chocolate corn tasseled early and were hardy and productive. For 3 years the process of selecting and planting the yellow kernels from the chocolate-colored ears was repeated in an attempt to fix a yellow sweet corn. In 1924, the seed was moved south to Wapato in the Yakima Valley, and after 2 years of selection, a comparatively pure strain became established. This Mr. Shelton named Golden Pacific, but when in 1927 the variety was introduced, the name was changed to Burpee by the seed organization bearing that name.

Edible maturity was reached at Geneva in 72 days, 6 days earlier than Golden Bantam and 10 to 12 days later than Golden Gem and Spanish Gold. It is used as an early productive sort of more than ordinary quality. Although the ears are small, they are rather delicatelykerneled and attractive, rendering the variety of value to the early trucker and home garden enthusiast. The plants are about 1 foot shorter than Golden Bantam, produce more tillers, and therefore present the appearance of being more bushy. Kernels are more narrow



BUTTERCUP

(Four-fifths natural size)



CHARLEVOIX

(Four-fifths natural size)

and often more wrinkled; ears are about the same length as those of Bantam but much more plump.

Plant moderately short, $4\frac{1}{2}$ – $4\frac{3}{4}$ feet, stalks slender and moderately straight; nodes 7–8, covered, not prominent. Brace roots not present. Tillers moderately many, slightly shorter than and occasionally equal to central stalk. Leaves short and moderately narrow, $24\text{--}26 \times 3\frac{1}{2}\text{--}3\frac{7}{8}$ inches; sheath longer than internode. Tassel short and slender, 12–15 inches; terminal spike erect; lateral spikelets short, nearly erect, many present, rather crowded and usually simple; bracts green, sparsely striped with red; anthers variable in color; 52–54 days to anthesis.

Ears borne at 3rd and 4th nodes, often two ears per stalk. Shank moderately variable in length. Husks brittle, few, quite thick and rather tightly wrapped. Husked ear moderately short and plump, $6\text{--}7 \times 1\frac{5}{8}\text{--}1\frac{3}{4}$ inches, nearly cylindrical with a slight taper near the tip; rows 12–14, usually regular and straight, uniform and attractive.

Kernels at milk stage light yellow, medium size, rather shallow and medium width; at dry stage dull yellow, medium long and rather narrow, $1.1 \times .92 \times .32$ cm. (140 seeds per oz.); triangular in shape; crown rounded; surface rather finely and abundantly wrinkled; set moderately tight on cob.

Buttercup. Refs. 247, 335, 345, 478, 525. Illus. 72.

No one questions the supremacy of Golden Bantam in the entire group of yellow sweet corns. When it comes to choosing a yellow variety that can be termed second best, we are confronted with the problem of evaluating the qualities of earliness, size of ear, and quality. On the basis of quality and attractiveness of ear Buttercup has much to commend it to all who are growing for home use or for a discriminating market. Joseph Harris Co., Coldwater, New York, were the introducers in 1910, after securing the seed for increase from A. H. Drake of East Brookfield, Massachusetts. Mr. Drake was a market gardener who lived in the rather high section of central Massachusetts. This region has many lakes which induce a large perennial summer population as a market for fresh vegetables. This trade invariably choose the Buttercup corn grown by Mr. Drake in preference to any other.

At Geneva edible ears were produced in 78 days, identical in season to Golden Bantam, 6 days later than Golden Sunshine and about 5 days earlier than Golden Giant. This variety is used by growers who desire a longer and slightly more plump ear than Golden Bantam. It has been found to be quite sweet and tender, although somewhat lacking in flavor as manifested in Golden Bantam. Its long ears with large kernels of a rich yellow color which are sweet and tender cause many to consider Buttercup even better in quality than Golden Bantam. It most resembles Barden's Wonder Bantam in type, the plants being more slender, lighter green in foliage, and less inclined to tiller. The edible ears will also tend to be more cylindrical with a larger proportion of 8-rowed specimens present and more completely filled with kernels at the tip.

Plant medium tall, $5\frac{1}{2}$ –6 feet; stalks slender, moderately zigzag; nodes 8–9, exposed, prominent. Brace roots present, useful, moderately heavy, whorl complete on one node. Tillers, many present, nearly as tall as central stalk. Leaves moderately long and moderately broad, $30\text{--}32 \times 3\frac{1}{2}\text{--}4$ inches; sheath shorter than internode. Tassel moderately long and slender, 20–22 inches; terminal spike slightly drooping; lateral spikelets drooping, moderately many, multi-branched at the base; bracts green, distinctly

striped with moderately deep red; anthers variable in color; 58–60 days to anthesis.

Ears borne at 3rd and 4th nodes, one ear per stalk, with an additional nubbin usually present. Shank variable in length, usually rather long, 6–8 inches, moderately heavy. Husks many, moderately short, and rather tightly wrapped, easily removed. Husked ear moderately long and moderately slender, $8\text{--}9 \times 1\frac{1}{2}\text{--}1\frac{3}{4}$ inches, partly cylindrical, tapering near the apex; rows 8–10, usually regular, occasionally paired on 8-rowed specimens.

Kernels at milk stage pale orange yellow, moderately large, wide, moderately thin and medium depth; at dry stage, dull orange yellow, wider than long, $.89 \times 1.03 \times .35$ cm. (116 seeds per oz.); short, broad ovate in shape; crown rounded; surface abundantly and very finely wrinkled; set tightly on cob.

Carmel Golden. Ref. 379.

So far this variety has found a place only in California where it was first introduced in 1923 by C. C. Morse & Co. of San Francisco. The small-eared varieties, either white or yellow, such as Cory, Early Market, and Golden Bantam, are not popular in California with either grower or consumer. Ears must be big and therefore this selection was made from Golden Bantam as a strain having ears with more rows and a longer cob. The careful work of selection was done by Mr. Andrew Stewart, a rancher in the Carmel Valley.

Eighty days were required for the edible ears to reach maturity at Geneva. This proved to be 2 days later than Golden Bantam and 3 days earlier than Golden Giant. This variety is used extensively in certain areas of California where it is claimed to be more adaptable. As grown at Geneva, the plant is shorter than Golden Bantam, more stocky, and possesses leaves that are much broader than any other in its class. It has often been considered similar to Charlevoix, but in the tests at Geneva Charlevoix proved to be a more vigorous, slender grower, producing ears that were finer kernalled and much more attractive.

Plant moderately short, $4\frac{1}{4}\text{--}4\frac{3}{4}$ feet; stalks moderately heavy and straight; nodes 7–8, covered, not prominent. Tillers many, much shorter than central stalk. Leaves medium long and distinctly broad, $28\text{--}30 \times 4\text{--}4\frac{1}{2}$ inches; sheath longer than internode. Tassel moderately short, 14–16 inches, heavy and coarse, terminal spike erect, lateral spikelets moderately drooping, many, long, and rather evenly distributed; bracts and anthers variable in color; 58–60 days to anthesis.

Ears borne at 3rd and 4th nodes, one ear per stalk with an additional nubbin usually present. Shank short, 2–3 inches, brittle. Husk leaves many, short, and moderately heavy; husks many, moderately short and heavy, wrapped rather tightly. Husked ear moderately long and medium plump, $8\text{--}9 \times 1\frac{5}{8}\text{--}1\frac{7}{8}$ inches, partly cylindrical and slightly tapering; tip conical and usually exposed; rows 10–12, inclined to be somewhat irregular, often spiral to curved, crowded around the cob.

Kernels at milk stage light to medium yellow, medium size and depth; at dry stage amber yellow, moderately broad, long, and thick, $1.1 \times .99 \times .4$ cm. (112 seeds per oz.); roughly triangular in shape; crown slightly rounded; surface very rough, coarse, often deeply ridged and creased, rather coarsely wrinkled; set moderately tight on the cob.

Charlevoix. Refs. 124, 130, 176, 344, 413, 562. Syn. Gold Standard. Illus. 25, 73.

Although listed in the 1933 catalog of the introducer as Gold Standard, this variety has been known as Charlevoix since its introduction in 1917 by the D. M. Ferry Co. of Detroit. In 1895, F. J. Meech, a farmer at

Charlevoix, Michigan, and known as one of the best gardeners of the state, received some seed from a friend in New England. The seed was planted and its progeny grown and reselected by Mr. Meech and his neighbors for many years. It was subsequently obtained and introduced by D. M. Ferry, 22 years later. For many years it had retained its popularity among the summer visitors of northern Michigan. This is one more of the important yellow varieties that can be traced back to New England.

Charlevoix reached edible maturity at Geneva in 78 days, the same as Golden Bantam. This was 6 days later than Golden Sunshine and 5 days earlier than Golden Giant. Plants of Charlevoix are slightly shorter and more stocky than Golden Bantam, more like a good strain of 10- to 14-row Golden Bantam in this respect. The ears are more uniform and attractive than 10- to 14-rowed Bantam, with dry ears showing kernels with greater uniformity in wrinkling. This sweet corn has found considerable favor in the eyes of the three important users of sweet corn—the home gardener, market gardener, and canner.

Plant medium tall, $4\frac{1}{2}$ –5 feet; stalks slender, straight; nodes 8–9, usually covered, not prominent; internodes often blotched with red on exposed portions. Brace roots present, slender, whorl complete on one node, useful. Tillers many present, nearly as tall as central stalk. Leaves rather short and moderately narrow, 22–24 x $3\frac{1}{4}$ – $3\frac{3}{4}$ inches; sheath usually longer than internode, although occasionally equal to it. Tassel moderately short and stout, 14–15 inches; terminal spike erect; lateral spikelets moderately drooping, slender, many present, quite crowded, usually simple; bracts green, rather heavily striped with red; anthers bronze red (dark vinaceous); 60–62 days to anthesis.

Ears borne at 4th and 5th nodes, often two ears per stalk. Shank variable, 2–8 inches, rather slender and brittle. Husk leaves small, short, and few present; husks moderately many, rather thin, wrapped moderately tight. Silk usually red, moderate amount, short, easily removed from cob. Husked ear medium long and moderately plump, 7–8 x $1\frac{3}{4}$ –2 inches; partly cylindrical, and slightly tapering, attractive; base rounded and compressed; tip broadly conical, usually well filled; rows 10–12, regular, crowded around cob.

Kernels at milk stage yellow, medium width, moderately thin and medium depth; at dry stage deep yellow, medium size, 1.0 x .9 x .38 cm. (124 seeds per oz.); distinctly triangular in shape; crown gently rounded; surface heavily wrinkled, usually rather deep and rough; set moderately loose on cob.

Cream and Honey. Ref. 47.

From 1911 to 1929 the J. Bolgiano Seed Co. of Baltimore, Maryland, offered this variety with the name that “carries the mind back to the ‘Promised Land’ flowing with ‘Milk and Honey.’” During this time it was a 10- to 12-row type with ears from 5 to 6 inches long. The variety as grown in our trials and offered after 1930 produced an 8-rowed ear and, as advertised, was a selected strain of Golden Bantam.

Early Golden. Refs. 6, 226, 233, 348, 464. Syn. Early Golden Improved.

At Yankton, South Dakota, the Gurney Seed Co. originated this sweet corn, a cross between Golden Bantam and Early Evergreen. First offered in 1908, it has been featured by them until 1930 when it was

replaced by Golden Sunshine. Aggeler and Musser Seed Co. of Los Angeles, California, and Thos. J. Grey Co. of Boston, Massachusetts, have also listed the variety as a second early to follow Golden Bantam.

At Geneva edible ears were produced in 82 days, 8 days earlier than Bantam Evergreen, about equal in season to Golden Giant, and 10 days later than Sunshine. Edible ears resemble Golden Giant, although the kernels are slightly smaller, and more finely wrinkled. The plants are much taller, with tassels longer, both terminal and lateral spikes and spikelets, than Golden Giant. In this respect it is more like Bantam Evergreen. Dry ears are more slender than Bantam Evergreen, with kernels somewhat smaller but nearly as loosely set on the cob.

Plant moderately tall, $6\frac{1}{2}$ feet; stalks straight and medium slender; nodes 9–10, usually covered to slightly exposed, not very prominent. Brace roots occasionally present, rather slender, whorl complete on one node. Tillers many, nearly as tall as central stalk. Tassel moderately long, 18–20 inches, rather slender.

Ears borne at 4th and 5th nodes, one and occasionally two ears per stalk. Husks many, moderately long, heavy and rather tightly wrapped. Husked ear medium long and moderately plump, 7–8 x $1\frac{3}{4}$ – $1\frac{7}{8}$ inches, moderately tapering; tip abruptly conical; rows 12–16, moderately straight, somewhat irregular at the base.

Kernels at milk stage light yellow, medium size, rather narrow on 16-rowed ears, deep; at dry stage, bright orange yellow, longer than broad, 1.1 x .9 x .36 cm. (144 seeds per oz.); triangular; crown slightly rounded; surface rather abundantly but shallowly wrinkled; set moderately loose on cob.

Early Golden Sunrise. Ref. 152.

This variety originated on the farm of George S. Steele at Hudson, New Hampshire. Thos. W. Emerson Co. of Boston, became interested in the variety and introduced it in 1914. After 19 years of listing Golden Bantam, they credit Emerson's Early Golden Sunrise corn as the best golden corn they ever cataloged. Inasmuch as the name Golden Sunrise has been used with several other introductions, the term Early is associated with this strain to distinguish it from the Golden Sunrise offered by D. Landreth Co.

Edible ears were produced in 84 days at Geneva, 6 days later than Golden Bantam and about the same season as Golden Giant. It most resembles Golden Orange in plant characters, although it is much less inclined to tiller. The ears are somewhat more slender and with fewer rows. It is used in certain areas of the New England states by canners and growers “who insist upon procuring the highest grade of sweet corn for their most critical trade.”

Plant medium tall, $5\frac{1}{2}$ –6 feet; stalks medium heavy and moderately straight; nodes 8–9; brace roots present, with whorl complete on one node, tillers few, much shorter than central stalk. Tassel medium long and slender, 16–18 inches; lateral spikelets horizontal to slightly drooping, many present and rather crowded.

Ears borne at 4th and 5th nodes, one and occasionally two ears per stalk. Husked ears medium long and moderately plump, 7–8 x $1\frac{5}{8}$ – $1\frac{7}{8}$ inches, moderately tapering; rows 10–12, usually straight and regular.

Kernels at milk stage yellow; medium width and depth; at dry stage dull amber yellow, slightly longer than broad; triangular in shape.

Early Golden Wonder. Ref. 321.

A selection from a cross between Extra Early Goose and Golden Bantam was offered in 1922 by C. J. Lindholm, Minneapolis, Minnesota. The variety evidently was not well fixed in type nor well adapted for market use, for after several years it disappeared from all listings.

Plant moderately short, $4\frac{1}{2}$ –5 feet; stalks slender and straight. Tillers many. Tassels long, lateral spikelets many, medium long and crowded. Ears borne at 4th and 5th nodes, one and occasionally two ears per stalk. Husks many, medium heavy and long; silk long and abundant, red. Husked ear moderately short and moderately slender, $6-7 \times 1\frac{1}{2}-1\frac{5}{8}$ inches, slightly tapering; rows 10–12 regular, straight and crowded around the cob.

Kernels at milk stage yellow, narrow and shallow; at dry stage dull yellow, very small, somewhat triangular.

Early Orange. Refs. 22, 89, 91, 290, 405, 432, 482, 507, 508, 537, 538. Syns. Brighton Orange, Early Orange Sugar, Orange.

The method commonly used by growers for nearly a hundred years to produce new varieties of sweet corn was to cross those available and by careful observations select the outstanding progeny. In 1883, Hiram Sibley of Rochester, New York, introduced a new hybrid resulting from a cross between Narragansett and Moore's Early Concord. About 5 years had been used in segregating this sweet corn of an entirely new color. We are placing it in the yellow group partially because of the name and also because in some of the early descriptions the kernel is given as a light flesh red with a slight perceptible orange tint. The two parents are discussed in the white sweet corn section where it is well to note that each parent resulted from crossing types that were very distinct in ear characters. Comparing the kernels of this with the present Golden Orange, we find the modern strain with rather narrow deep kernels whereas the older type had kernels as broad as deep.

Plant moderately tall, 6 feet. Ears borne 30 inches from the ground; husked ear moderately short and moderately plump, $6-7 \times 1\frac{3}{4}-1\frac{7}{8}$ inches, moderately tapering; tip abruptly conical to rounded; rows 12–14.

Kernels dull yellow; at dry stage light flesh red with a slight orange tint; as broad as deep; crown slightly rounded; surface finely wrinkled.

Early Yellow Sensation. Ref. 566.

This comparatively new variety, originated and introduced in 1931 by F. H. Woodruff & Sons of Milford, Connecticut, came from a cross between Extra Early Yellow and Golden Bantam. During the last 10 years there has been a large number of new yellow varieties introduced, most of which have originated from crosses using Golden Bantam as one parent. The object of the various crosses has been to produce changes in two directions, *viz.*, earliness and ear size. This variety as noted below may have both earliness and size; at least the variety is on probation before its rightful place can be assumed.

Edible ears were produced at Geneva in 72 days, 6 days earlier than Golden Bantam, in season with Burpee and 4 days later than Golden Early Market. The plants most resemble those of Golden Early Market,

but the husked edible ears are slightly longer and decidedly more tapering. In the dry stage the ears most resemble Burpee both in color and narrowness of grains as well as in ear conformation.

Plant medium tall, 5–5 $\frac{1}{2}$ feet; stalks rather coarse and decidedly zigzag; nodes 8–9, exposed, very prominent, exposed portions of internodes usually solid dark red. Tillers few, much shorter than the central stalk. Leaves short and moderately narrow, $24-26 \times 3-3\frac{1}{2}$ inches; sheath much shorter than internode. Tassel moderately short and slender, 15–16 inches; terminal spike erect; lateral spikelets nearly erect, many, short and crowded; bracts dark green, moderately striped with light red; anthers variable in color; 54–55 days to anthesis.

Ears borne at 3rd and 4th nodes, one ear per stalk with an additional nubbin usually present. Husk leaves moderately many, short and distinctly pendant; husks short, moderately heavy, wrapped loosely but easily removed. Husked ear medium long and moderately plump, $7-8 \times 1\frac{3}{4}-1\frac{7}{8}$ inches, tapering, tip sharply conical; rows 12–16, usually regular but occasionally somewhat twisted at the base, crowded around the cob.

Kernels at milk stage light yellow, medium size; at dry stage distinctly pale amber yellow, medium wide and long, $1.06 \times .90 \times .36$ cm. (108 seeds per oz.); definitely triangular in shape; crown rounded; surface quite deeply ridged and wrinkled; embryo distinctly long, broad and prominent; tightly set on cob.

Giant Golden Sweet, Carpenter's. Ref. 225. Syn. Carpenter's Golden Sweet.

For several years after the introduction of Golden Bantam a seed house offered other yellow varieties only with some sort of an apology. Gregory in 1911 said, "The demand we have had for the Golden Bantam and the Golden Honey during the past two years shows us that the Golden sweet varieties are meeting with popular approval. We feel justified in presenting to our friends this season the Carpenter's Golden Sweet, which came to us from a party in Pennsylvania bearing that name. As a special feature of its high quality the variety supposedly does not have that mealy taste so characteristic of the yellow varieties." Thus, we see that 9 years after the yellow Golden Bantam was introduced there were still certain prejudices against yellow corn in general that had not been abated.

Edible ears were produced at Geneva in 81 days, 3 days later than Golden Bantam, 6 days after Sweet Orange, and 2 days earlier than Golden Giant. The plants are much taller than Golden Giant and possess foliage that is lighter green in color, much broader, and more abundant. In comparison to Sweet Orange, the variety it most resembles, plants are about 1 foot taller and decidedly heavier. The ears are very similar, altho Sweet Orange tends to be somewhat more slender with two to four less rows and with kernels that in the milk stage are a deeper orange color, although in later stages the two varieties are less distinct in this respect.

Plant tall, 6–6 $\frac{1}{2}$ feet; stalks moderately heavy and straight; nodes 10–12, usually covered, not prominent. Brace roots present, moderately heavy and useful, whorl complete on one node. Tillers usually many present. Leaves long and broad, $32-34 \times 4-4\frac{1}{2}$ inches; sheath usually equal to but occasionally longer than internode. Tassel moderately long, 18–20 inches, solid dark green at the base; terminal spike moderately erect; lateral spikelets drooping, moderately long, many, rather crowded, but evenly distributed; bracts green, sparsely striped with red; anthers buff color (chamois to deep colonial buff); 64–65 days to anthesis.

Ears borne at 4th and 6th nodes, one ear per stalk with an additional nubbin usually present. Shank moderately short, 3-4 inches, slender and brittle. Husk leaves few and rather short; husks long, moderately heavy and rather tightly wrapped. Husked ear medium long and moderately plump, 7-8 x $1\frac{3}{4}$ -2 inches, partly cylindrical and slightly tapering; rows 14-16, straight, crowded around the cob, very attractive.

Kernels at milk stage light yellow, narrow, thick and rather shallow; at dry stage distinctly deep orange, very small, .95 x .8 x .33 cm. (200 seeds per oz.); ovate, occasionally somewhat triangular; crown distinctly rounded; surface abundantly and very finely wrinkled; set very tightly and firmly on cob.

Gold Bond. Ref. 307.

This variety was selected from Golden Giant and offered about 1929 by the Kilgore Seed Co. of Florida. Since it is a straight selection from Golden Giant, which is of hybrid origin, it is perhaps subject to small variations of plant and ear.

At Geneva edible ears were produced in 76 days, 7 days earlier than Golden Giant, the variety it most resembles, and 4 days later than Golden Sunshine. Because of its apparent vigor and productiveness, it has been used with some success in some of the southern states where difficulty has been experienced in producing true sweet corn varieties. The plants of Gold Bond are slightly taller than Golden Giant but decidedly more stocky and more inclined to tiller. The foliage is also a darker green with leaves much longer and broader than those of Golden Giant. The ears are slightly longer and will average two less rows, although the differences in this respect are not very noticeable.

Plant medium tall, $5\frac{1}{2}$ -6 feet, very coarse and bushy, stout; stalks moderately heavy and slightly zigzag; nodes 9-10, covered, not prominent. Tillers many, nearly as tall as central stalk. Leaves long and broad, 34-36 x $4\frac{1}{2}$ inches; sheath longer than internode. Tassel moderately long and heavy, 18-20 inches; terminal spike erect; lateral spikelets drooping, many, long and crowded; bracts green, moderately striped with red; anthers buff color (chamois to deep colonial buff); 58-60 days to anthesis.

Ears borne at 4th and 5th nodes, one ear per stalk with a fair sized nubbin present. Shank short and heavy, 2-3 inches. Husk leaves short, many and possess a shade of green very similar to the husks; husks moderately few, rather short and rather tightly wrapped. Husked ear moderately long and plump, 7-9 x $1\frac{7}{8}$ -2 inches, moderately tapering, often somewhat cylindrical; rows 12-14, regular and straight, crowded around the cob.

Kernels at milk stage maize yellow to pale orange, moderately narrow and medium depth; at the dry stage deep yellow, medium width and moderately long, .88 x 1.1 x .40 cm. (130 seeds per oz.); triangular in shape; crown slightly rounded; surface rough and rather deeply and abundantly wrinkled; set moderately loose on cob.

Gold Coin. Ref. 86. Syn. New Yellow. Illus. 25, 26.

This variety was offered by Burpee in 1930 and in our trials has shown considerable promise. A New Jersey market gardener, E. R. Stover, offered seed to Burpee in 1928 and it was grown in their trials in 1929. Mr. Stover had named it "New Yellow," but when Burpee accepted it as a new variety the name was changed to Gold Coin.

At Geneva 76 days were required for ears to reach edible maturity, which proved to be 1 week earlier than Golden Giant, 2 days earlier than Golden Bantam, and 4 days later than Golden Sunshine. The plants of

Gold Coin show much less red than Golden Giant, produce decidedly more tillers, and consequently present a much more bushy habit of growth. The husked ear will average slightly longer with less rows and is more attractive. Kernels at the milk stage are lighter yellow and somewhat broader. The variety has not been sufficiently well known to warrant any logical criticism at this time. Its performance at Geneva has been favorable in respect to earliness, vigor, quality, and attractiveness.

Plant medium tall, 5- $5\frac{1}{2}$ feet, stalks slender and moderately straight; nodes 8-9, covered, not prominent; internodes blotched with red at base. Brace roots present and complete on one node, useful. Tillers moderately many, nearly as tall as central stalk; entire plant assumes rather stocky, bushy habit. Leaves medium long and moderately broad, 28-30 x $3\frac{1}{2}$ -4 inches; sheath distinctly longer than internode. Tassel moderately short and stout, 14-15 inches, terminal spike erect; lateral spikelets nearly erect, many, long, and crowded; bracts pale green, moderately striped with red; anthers buff (chamois to deep colonial buff); 58-60 days to anthesis.

Ears borne at 3rd and 4th nodes, one ear per stalk with an additional nubbin present. Shank usually short and heavy. Husks many, thick, moderately long and loosely wrapped. Husked ear moderately long and plump, 8-9 x $1\frac{3}{4}$ -2 inches, partly cylindrical and slightly tapering; tip broadly conical; rows 12-14, regular straight, crowded around the cob.

Kernels at milk stage moderately light yellow, broad, rather thin and medium deep; at dry stage deep yellow, moderately large, 1.04 x 1.0 x .39 cm. (116 seeds per oz.); roughly triangular in shape; crown rounded; surface very rough and coarsely wrinkled; rather irregular with deep folds and creases. Set moderately loose on cob.

Gold Coin, Livingston's. Refs. 22, 23, 90, 91, 92, 94, 120, 121, 125, 188, 274, 275, 322, 367, 411, 509, 510, 512, 514, 536, 537, 538. Syn. New Gold Coin.

Under this name there were two distinct introductions, one offered simultaneously in 1890 by Livingston and Gregory as Gold Coin, and the other not appearing until 40 years later, 1930, as Burpee's Gold Coin. The source of the first Gold Coin is not definitely known, although it supposedly came from a cross between a yellow dent and Stowell's Evergreen. However noteworthy its qualifications, Gold Coin was not listed by Livingston after 1900; in fact the catalogs of that firm carried no other yellow until Golden Bantam was accepted in 1910. Gregory, in 1906, says, "Several years ago a golden sweet corn was catalogued (we believe the name was 'Gold Coin'). It was very late and besides had a disagreeable field corn flavor."

Plant tall, 7-8 feet, stalks heavy and stout; tillers moderately few. Tassel long; terminal spike erect; lateral spikelets many, crowded and bushy. Ears borne $2\frac{1}{2}$ - $3\frac{1}{2}$ feet from the ground. Husked ear long and plump, 9-10 x 2- $2\frac{1}{2}$ inches, partly cylindrical and slightly tapering, tips abruptly conical to rounded; rows 14-16, regular, straight, crowded around the cob. Kernels at milk stage pale yellow in color; at dry stage large, much longer than broad; crown nearly flat; surface much wrinkled and creased; set very loosely on cob.

Gold Nugget. Ref. 111.

One of the novelties offered in 1914 by John Lewis Childs, Floral Park, New York, was a very dwarf yellow sweet corn from Maine. In growth the plant did not exceed 2 to 3 feet and the ears were set low on the



GOLD COIN

(Three-quarters natural size)



GOLDEN BANTAM

(Natural size)

stalk. Naturally, such a variety was of value only to home gardeners.

Golden Age, Lord's. Refs. 348, 497. Illus. 25.

For 4 years, 1929 to 1932, this was offered by Francis C. Stokes & Co. of Philadelphia, as a highly productive variety earlier than Golden Bantam. Evidently, from the appearance of the dry ear, it is a hybrid stock of Golden Bantam and Dighton parentage. James E. Lord of Stonington, Connecticut, was the originator and for 8 years prior to its introduction in 1929 by Stokes used the strain successfully to produce his earliest market corn.

Edible ears were produced at Geneva in 76 days; 2 days earlier than Golden Bantam and 4 days later than Golden Sunshine. The plants are shorter and more slender than those of Golden Bantam, while the tassels are shorter and with fewer laterals. The ears are usually 10-rowed, with kernels much more narrow than those of Bantam. In the dry stage the kernels assume a bronze tinge unlike any other yellow variety.

Plant moderately short, $4\frac{1}{2}$ –5 feet, stalks slender and moderately straight; nodes 6–7, usually slightly exposed, not prominent. Tillers few to none. Leaves short and moderately broad, 22–25 x $3\frac{1}{2}$ –4 inches; sheath equal to and occasionally shorter than internode. Tassel short and slender, 12–15 inches; terminal spike erect; lateral spikelets nearly erect, few, short, and not crowded; bracts and anthers variable in color; 56–57 days to anthesis.

Ears borne at 3rd and 4th nodes, one and occasionally two ears per stalk. Shank long and slender, 3–6 inches. Husk leaves few and short; husks moderately few, light, short and loosely wrapped. Husked ear moderately short and slender, 6–7 x $1\frac{1}{4}$ – $1\frac{1}{2}$ inches, moderately tapering, partly cylindrical; tip sharply conical; rows 8–10, straight, quite noticeably paired, not crowded around the cob, furrows deep and narrow when present.

Kernels at milk stage yellow, small and shallow; at dry stage reddish yellow, equal in width and length, .99 x .98 x .38 cm. (128 seeds per oz.); short broad oval, almost square in shape; crown slightly rounded; surface sparsely and very shallowly wrinkled; set tightly on cob.

Golden Alpha. Ref. 476.

This new variety, introduced in 1932, is as yet untried in the gardens and markets of most of the United States. C. S. Clark & Sons, Wakeman, Ohio, corn seed growers since 1878, have for some time been working to produce better varieties of yellow corns. C. A. Barden of that firm crossed Alpha with his earlier introduction, Barden's Wonder Bantam, to combine earliness and quality. The variety which was created and selected was introduced as the trend toward yellow sweet corn was very definite and also as the new and larger hybrid inbreds were becoming more popular.

Edible ears were produced in about 74 to 76 days at Geneva, which was 3 to 4 days earlier than Golden Bantam and about the same number of days later than Golden Sunshine. The plants are more stocky and bear their ears higher up on the plant than does Golden Bantam.

Plant medium height, $4\frac{1}{2}$ –5 feet; stalks sturdy and vigorous; tillers many, slightly shorter than antral stalk. Ears borne at 4th and 5th nodes; husks medium in number and moderately tight wrapped. Husked ears medium long and moderately slender, 6–8 x $1\frac{1}{2}$ – $1\frac{3}{4}$ inches, nearly cylindrical, slightly tapering at apex; rows uniformly somewhat open at the base. Kernels at milk stage

yellow, medium size, shallow; at dry stage dull amber yellow, wider than long; broad ovate in shape; crown decidedly rounded, nearly semi-circular.

Golden Bantam. Refs. 28, 56, 79, 103, 124, 127, 132, 136, 180, 205, 238, 248, 295, 298, 335, 344, 345, 347, 348, 365, 384, 399, 403, 406, 413, 460, 467, 480, 490, 493, 499, 525, 546, 564. Syns. Beauty Bantam, Gold Medal, Golden Glory, Golden West, Pure Gold, Sweet Bantam. Illus. 25, 27.

Golden Bantam was introduced by W. Atlee Burpee Company in 1902. This is the best and most favorably known of all the yellow varieties of sweet corn. The type represented here has been in common cultivation in the United States for perhaps 70 years and was known at various times as Golden, Golden Sweet, Golden Sugar, Golden Nugget, etc., but it remained for the late W. Atlee Burpee to popularize it under the name Golden Bantam. The following is an excerpt from the *Boston Transcript* of August, 1926:

"More than fifty years ago Hovey & Company, seed merchants of Boston, sold to all comers their Golden Sweet, a variety which was the direct progenitor of the modern Golden Bantam. It is related that one of their customers, a very enthusiastic amateur gardener, grew the Golden Sweet for many years, selecting and refining the gold until he had produced the substantial improvements which characterize the newer variety. When this old gentleman died his contribution to a higher civilization was sold to one of the big seedsmen.

"This dealer grew a large stock of it, rechristened it and offered it to the public in 1902. In the twenty-four years since then it has made more friends than anyone else could make outside the movies. Which proves that popularity does sometimes follow real merit."

Accurate information which will place definitely the history of most of our old varieties is lacking. As in all varieties the evidence available is related to show the most probable origin and the progress of the variety, In 1898, E. L. Coy of Washington County, New York, a veteran seed grower and expert on potato varieties, when visiting a cousin at Greenfield, Massachusetts, was served sweet corn at dinner. He was very much impressed by the quality of the corn and upon investigation learned that it had come from the garden of J. G. Pickett. The variety had come to Mr. Pickett upon the death of an old gentleman "who had a fancy for furnishing his friends with some choice early corn long before they had thought of having any ripe enough for the table,—but he would never let any of them have any to plant."

In the spring of 1900, Mr. Coy secured from Mr. Pickett all the seed he could spare (less than 2 quarts) and sent it to Mr. Burpee with this notation, "you now own the very sweetest and richest corn ever known." After 2 years' trial the career of Golden Bantam was launched. At first its progress was slow for it was a yellow corn and therefore had much adverse popular opinion to overcome. Henry A. Dreer wrote in 1906, "when one gets the sweet delicious taste, the color of the grains is forgotten."

Edible ears were produced at Geneva in 78 days,

6 days later than Golden Sunshine and 5 days earlier than Golden Giant. This has been for several years the most popular sweet corn for all purposes. The name has become so thoroughly impregnated in the minds of the growers and consumers that many of them will not accept anything else. Such faith has of course made an impression on those interested in breeding and selection, so that continual work of this nature has gone ahead in order to increase the quality of the desirable characteristics and to limit the presence of inferior ones. It is evident, then, that Golden Bantam has assumed the position it now holds because of its rare quality and wide adaptability. The plants are about equal in height to Golden Giant, but somewhat more slender, while the stalks are more often streaked with red and not as heavily braced. The ears are shorter than Barden's Wonder Bantam, with kernels slightly more narrow.

Undoubtedly more individual strains have been selected from Golden Bantam and given equally as many name variations, than any other sweet corn variety. This condition has brought about a great mass of Golden Bantam strains which, because of such factors as climate, location, and utility, have been selected and grown for market. Such recognized names as Extra Early Bantam, Golden Bantam Selected, Golden Bantam Improved, Golden Bantam Massachusetts Grown, Golden Bantam Mountain Grown, and Minnesota 8-rowed Golden Bantam, are in themselves examples of the influence of season or section on the selection of that particular strain. Their favorable points are recognized, be it in relation to season or climatic adaptability, yet the differences are truly variations in strain and therefore are not given individual treatment in this study. The description that follows is meant to convey a word picture of the true type which for many years has meant so much to the professional and amateur gardener alike.

Plant medium tall, 5-5½ feet; stalks slender, moderately straight; nodes 8-9, partially covered and occasionally prominent; internodes streaked and blotched with red on exposed portions. Brace roots usually not present. Tillers variable in number. Leaves medium long and narrow, 28-30 x 3½-3¾ inches; sheath equal to and occasionally shorter than internode. Tassel moderately short and moderately slender, 14-16 inches, occasionally colored at the base; terminal spike erect; lateral spikelets nearly erect to slightly drooping, many present, short, simple and moderately well distributed; bracts green, striped with slight to moderate amount of red; anthers usually buff colored (deep colonial buff) although some strains also produce some that are reddish bronze (*terra cotta*); 58-60 days to anthesis.

Ears borne at 3rd and 4th nodes, often two ears per stalk with an additional nubbin occasionally present. Shank 3-5 inches long, slender, brittle. Husk leaves few, short and moderately light; husks medium in number, thin; inner layer of the inside husks adheres to kernels, not easily removed. Silk rather short and scanty, variable in color, easily removed. Husked ear medium long and slender, 6-7 x 1½-1⅝ inches, nearly cylindrical with a very slight taper at tip end; base rounded and tip conical; rows 8, regular, straight, and uniformly spaced.

Kernels at milk stage yellow, rather large, broad, moderately thick and shallow; at dry stage amber yellow, medium size, .88 x 1.08 x .38 cm. (125 seeds per oz.); short, moderately broad ovate; crown distinctly rounded, semi-circular; surface rough, finely wrinkled; set slightly loose on cob.

Golden Bantam, 10- to 14-Rowed. Refs. 21, 279. Syn.

Giant Golden Bantam, Improved Golden Bantam.

To some, the small size of the ear has been one of the most desirable characters of Golden Bantam; to others, the smallness of ear has been most objectionable. Many attempts have been made by crossing or by selection to increase both vigor of plant and size of ear of the variety. In 1922, the Everett B. Clark Seed Co., of Milford, Connecticut, now the Associated Seed Growers, Inc., introduced Golden Bantam 10- to 14-Rowed as a selection from the original Golden Bantam. This strain has been continued as a large Bantam particularly desirable for canners and market gardeners.

Edible ears were produced at Geneva in 78 days, the same as Golden Bantam, 6 days later than Golden Sunshine and 5 days earlier than Golden Giant. The plants are as a rule more stocky and inclined to produce more tillers than the regular Golden Bantam. The ears have from 10 to 14 rows instead of 8, and consequently are much plumper and less tapering.

Plant moderately short, 4½-5 feet, stalks slender and moderately straight; nodes 8-9, exposed and prominent, internodes streaked with red on the exposed portions. Tillers many, nearly as tall as central stalk. Leaves moderately short and moderately narrow, 26-28 x 3-3½ inches; sheath distinctly shorter than internode. Tassel moderately short and heavy, 14-15 inches, colored at the base; terminal spike erect; lateral spikelets somewhat drooping, short, many and crowded; bracts green, moderately striped with red; anthers usually buff (deep colonial buff), occasionally a few reddish bronze (*terra cotta*); 60 days to anthesis.

Ears borne at 3rd and 4th nodes, often two ears per stalk; shank short, 2-3 inches, moderately heavy and brittle. Husks moderately many, thick, rather tightly wrapped and medium long. Husked ear medium long and moderately plump, 6-7 x 1½-1¾ inches, nearly cylindrical, slightly tapering; base slightly enlarged and compressed; tip abruptly conical; rows 10-14, usually straight, occasionally irregular at the base, crowded around the cob.

Kernels at milk stage light yellow, moderately wide and medium shallow; at dry stage dull orange yellow, medium size, slightly longer than wide, 1.05 x .95 x .35 cm. (124 seeds per oz.); triangular in shape; crown slightly rounded; surface rather finely but shallowly wrinkled; rather loosely set on cob; occasionally tight.

Golden Cory. Refs. 73, 321. Syn. Early Yellow Cory.

This was offered by Chas. J. Lindholm, Minneapolis, Minnesota, as new in 1922 and again in 1928. Since in both cases it was said to have come from a cross between Mammoth Cory and Golden Bantam, we assume that the original introduction was lost and that the later introduction represents a new line. This might possibly account for the 1922 stock having 14 to 16 rows and that of 1928 from 10 to 12 rows.

Plant moderately short, 4½-5 feet; stalks slender and somewhat zigzag; nodes 8-10, slightly exposed but not very prominent. Tassel medium long, 15-18 inches, slender; terminal spike erect; lateral spikelets horizontal, short and medium in number.

Ears borne at 3rd and 4th nodes, one and occasionally two ears per plant. Shank short and slender. Husks few, rather short and loosely wrapped, easily removed. Husked ear medium long and moderately plump, 7-8 x 1⅝-1⅞ inches, moderately tapering; rows 12-14, straight, regular, crowded around the cob.

Kernels at milk stage yellow, rather narrow, medium depth and thickness; at dry stage dull amber yellow, small, short and narrow, .9 x .92 x .35 cm. (156 seeds per oz.); somewhat triangular; crown slightly rounded; surface abundantly but shallowly wrinkled; set tightly on cob.

Golden Cream. Refs. 41, 45, 124, 141, 335, 344, 373, 377, 525. Syns. California Golden Country Gentleman, Golden Bantam Shoe Peg, Golden Country Gentleman. Illus. 25, 80.

When Country Gentleman was introduced in 1890 its sponsors were loud in their praise of its nectar-like sweetness and its milky character. Perhaps this feature led C. C. Morse & Co. of San Francisco, to bestow the name Golden Cream on the new yellow corn which they purchased from the originator, Thomas Gould of Ventura, California. Mr. Gould had made a cross between Country Gentleman and Golden Bantam, naming his selection Golden Gentleman. Stock seed was purchased by Mr. Morse in 1908, and after selections had been made, the variety was offered in 1911 under the name of Morse's Golden Cream. Seed was sent East as early as 1910 for seed increase purposes and so Dreer, Thorburn, Childs, and others listed the new creation in 1911 and 1912. It was truly the cream of the best, and only the shortness of the ear prevented its being called the "golden twin" of true Country Gentleman. This same shortness of ear probably was the direct cause for its popularity being limited to the home gardener.

Country Gentleman and Golden Bantam were crossed to produce Golden Cream. Fifteen years later (1926) Peter Henderson & Co. introduced Golden Country Gentleman, the result of a cross combining "all the sugary sweetness, tenderness and lusciousness of the original Country Gentleman, with the rich golden color now in such favor with lovers of sweet corn." Stocks of these two varieties, Golden Cream and Golden Country Gentleman, grown at Geneva have been found to be very nearly identical.

Eighty-eight days were required to reach edible maturity at Geneva. This proved to be 10 days later than Golden Bantam and 2 days earlier than Bantam Evergreen. Golden Cream is a taller grower than Golden Bantam, and it possesses more leaves and a tassel that is distinctly more bushy. With the exception of Papago, the husks are more tightly wrapped than any yellow variety. The silk is likewise much more abundant and more uniformly red than that of any other yellow sweet corn.

Plant moderately tall, $5\frac{1}{2}$ -6 feet, stalks slender, moderately straight; nodes 9-10, nearly covered, not prominent. Brace roots occasionally present on one node, slender, neither complete nor very useful. Tillers usually absent, decidedly shorter than central stalk. Leaves medium long and narrow, $28-30 \times 2\frac{1}{2}-3\frac{1}{4}$ inches; sheath equal to and longer than internode. Tassel moderately short and slender, 14-16 inches, not colored at the base; terminal spike erect; lateral spikelets drooping, simple with basal ones compound, many present, short and crowded; bracts green, distinctly striped with dark red, anthers very numerous, reddish bronze, (terra cotta to vinaceous russet); 66-68 days to anthesis.

Ears borne at 4th and 5th nodes, very often two ears per stalk. Shank short, 2-3 inches, slender and brittle. Husk leaves very few present, short and light; husks moderately few, very often streaked with purple on exposed surface, tightly wrapped, not easily removed. Silk uniformly dark red, long and very abundant. Husked ear moderately short, moderately plump at butt end, $6-7 \times 1\frac{1}{2}-1\frac{3}{4}$ inches, distinctly tapering; kernels arranged irregularly, no rows

present, exceedingly crowded; rounded at the base and very sharply conical at the tip; glumes very long and heavy.

Kernels at milk stage yellow, very deep and narrow, not uniform; at dry stage bright yellow, long, slender, peg-like or cuneate in shape; $1.1 \times .70 \times .33$ cm. (208 seeds per oz.); crown often dimple dented, angular; surface rough and rather finely and abundantly wrinkled; set moderately loose.

Golden Crosby. Ref. 21.

The name Golden Crosby was given to a composite of inbred strains produced by D. F. Jones at the Connecticut State Agricultural Experiment Station. The first of the crossing was made in 1924. Several inbred strains of Crosby sweet corn were received from the Maine Agricultural Experiment Station. Three of these were crossed with inbred strains of Golden Bantam originally obtained from the Vick Seed Company of Rochester, New York. From these crosses several lines were grown and self-pollinated for two generations. The best of these lines having all yellow sweet seeds were mixed and allowed to interpollinate. After 2 years the resulting combination, selected toward the Crosby type with all yellow kernels, was called Golden Crosby. The first seed was sold in 1928 by the Associated Seed Growers of New Haven, Connecticut.

Edible ears were produced at Geneva in 75 days, in season with Whipple's Yellow, 3 days earlier than Golden Bantam and 3 days later than Golden Sunshine. The plants are slightly shorter than Golden Bantam with tillers more abundant and nearly equal to the central stalk. The husked ear is slightly longer with the apex more definitely tapering. The kernels in the milk stage are more narrow and shallow with more rows per ear than Golden Bantam. The compactness and uniformity in kernel type indicate its similarity to the Crosby type.

Plant moderately short, $4\frac{1}{2}$ -5 feet; stalks slender and moderately zigzag; nodes 7-8, exposed and prominent. Tillers moderately many, nearly as tall and often equal to central stalk. Leaves medium long and moderately narrow, $28-30 \times 3-3\frac{1}{2}$ inches; sheath shorter than internode. Tassel medium long, 15-18 inches; terminal spike erect; lateral spikelets moderately drooping, variable in number, rather long and moderately scattered; bracts and anthers variable in color; 54-56 days to anthesis.

Ears borne at 2nd and 3rd nodes, one and occasionally two ears per stalk. Shank variable in length. Husks few, moderately short and rather tightly wrapped. Husked ear medium long and plump, $7-8 \times 1\frac{3}{4}-1\frac{7}{8}$ inches, partly cylindrical and moderately tapering; base distinctly rounded and compressed; tip sharply conical and usually exposed; rows 12, regular and straight, very crowded around the cob, uniform and attractive.

Kernels at milk stage light yellow, moderately narrow and shallow; at dry stage light golden orange, small, short, narrow and moderately thick, $.90 \times .81 \times .38$ cm. (170 seeds per oz.); distinctly triangular in shape; crown slightly rounded; surface moderately fine wrinkled; set very tight on cob.

Golden Dawn. Refs. 57, 182, 196, 238, 241, 348, 403, 406, 411. Syn. Mammoth Golden Dawn.

Golden Dawn preceded the introduction of Bantam Evergreen by 7 years. Henry A. Dreer of Philadelphia secured the seed stock in 1906 from Henry C. Anthony of Newport, Rhode Island, a well-known market gardener who was also a corn seed grower of considerable repute. The exact origin of this strain possessed by

Mr. Anthony remains unknown, although it is said to have come from a cross between Golden Bantam and Stowell's Evergreen.

Dreer called the variety Golden Dawn which was rather misleading, for the variety was not an early as the name Dawn might indicate. Dreer listed the variety continuously from 1906 to 1925. W. W. Rawson of Boston also listed a Golden Dawn in 1904, only 2 years after the introduction of Golden Bantam by Burpee.

Mammoth Golden Dawn, "a sort taken from the regular strain of Golden Dawn," was offered in 1920 by the Fottler, Fiske, Rawson Co. of Boston. This was discovered as a sport in a field of Golden Dawn where it was conspicuous by its size of ear. In habit of growth the plant resembled its parent, but the larger ear (14 to 16 rows) as illustrated appeared to be similar to ears of Golden Giant. The name does not appear after 1925.

In 1919, Joseph Breck & Sons of Boston offered a Golden Dawn which has been continued up to the present and is quite popular in New England. Records which would indicate whether the Golden Dawn of Breck is the same as the old strain of Golden Dawn first noted in 1904 are not available. The information included in this account, however, is based on the variety as it exists today.

Edible maturity was obtained at Geneva in 78 days, in season with Golden Bantam, 6 days later than Sunshine, and 5 days earlier than Golden Giant. The plants are considerably coarser and more stout than those of Golden Bantam, the leaves are longer, and the tassels are distinctly longer and heavier. The ears are similar to Gold Bond, about the same length but slightly less plump. The kernels are much broader and more shallow than those of Gold Bond, while in the dry stage they are very tightly set and sparsely wrinkled.

Plant medium tall, 5-5½ feet; stalks moderately slender and straight; nodes 9-10, exposed and prominent. Tillers many, slightly shorter and often as tall as central stalk. Leaves moderately long and broad, 30-32 x 3¾-4½ inches; sheath shorter than internode. Tassel distinctly long and heavy, 20-22 inches; terminal spike erect; lateral spikelets horizontal, moderately long and many present; bracts light green sparsely striped with light red; anthers variable in color, mostly (terra cotta); 54-58 days to anthesis.

Ears borne at 3rd and 4th nodes, one ear per stalk with an additional nubbin usually present. Shank medium long, 3-5 inches, moderately heavy but brittle. Husks moderately few, short, heavy and tightly wrapped. Husked ear moderately long and moderately plump, 8-9 x 1¾-1⅞ inches, moderately tapering; base moderately compressed, occasionally somewhat open; tip conical and slightly exposed; rows 10-12, moderately straight, occasionally somewhat irregular at the base; usually crowded around the cob.

Kernels at the milk stage yellow, large, moderately broad and thick; at dry stage dull amber yellow, medium size, slightly broader than long, 1.0 x 1.08 x .44 cm. (100 seeds per oz.); short broad ovate, occasionally somewhat triangular in shape; crown slightly rounded; surface very coarsely and sparsely wrinkled, often nearly smooth; set very tight on cob.

Golden Early Market. Refs. 114, 206, 319, 335, 345, 346, 347, 348. Syns. Extra Early Golden, Extra Early Yellow, Golden Hummer, Golden 60 Day.

This variety originated as a chance cross of Golden Bantam with Early White Market in a field of that

variety grown by Gill Bros. Seed Co. of Portland, Oregon. Some years previous to 1925, the year of its introduction by Gill Bros., officials of that company noticed the accidental cross. They realized the possibilities of such a combination and saved seed from the plant. Selections were made and a strain developed which was outstanding in earliness, good flavor, and productiveness.

Edible ears were produced at Geneva in 68 days, 4 days earlier than Golden Sunshine, 10 days earlier than Golden Bantam, and 6 days later than Spanish Gold. The plants are much coarser and more scraggly growing than any other yellow variety. The stalks are heavier than Golden Sunshine, are shorter and the nodes are exposed more prominently. The ear is about the same length but more abruptly conical at the tip than Golden Sunshine, while the kernels are broader and slightly larger. Golden Hummer, in the trials at Geneva, proved to be so similar to Golden Early Market that it was difficult to distinguish between them. Golden Hummer, however, produced ears slightly longer and more uniform in appearance than those of Golden Early Market, while the plants appeared to show more red streaking on the sheath and exposed internodes. The two were identical in season.

Plant moderately short, 4½-5 feet; stalks slender, moderately straight; nodes 7-8, exposed, prominent; internodes shaded dark red on exposed portions. Brace roots usually present and partially complete on one node. Tillers few, very often absent. Leaves short and moderately narrow, 24-26 x 3-3¾ inches; sheath distinctly shorter than internode. Tassel medium long and slender, 15-18 inches; terminal spike erect; lateral spikelets nearly erect, stiff, many present, short and crowded; bracts green, sparsely striped with moderately dark red; anthers variable in color; 52-55 days to anthesis.

Ears borne at 3rd and 4th nodes, one and occasionally two ears per stalk. Shank short, heavy but brittle; Husk leaves few, distinctly short and light; husks few, short, heavy, quite tightly wrapped. Husked ear moderately short and plump, 6-7 x 1⅞-2 inches, somewhat cylindrical with a moderate taper; tip rounded to abruptly conical; rows 12-14, quite regular, straight, crowded around the cob.

Kernels at milk stage yellow, medium size, moderately deep, wide and thick; at dry stage dull yellow, fairly broad and long, 1.0 x 1.0 x .37 cm. (128 seeds per oz.); triangular; crown slightly rounded; surface rather sparsely and shallowly wrinkled, often distinctly irregularly crease-dented; set moderately loose on cob.

Golden Gem. Refs. 232, 335, 345, 347, 348, 571.

Syns. Early Golden Gem, Gold Nugget. Illus. 25.

This variety is the result of the work during the last 10 years of Professor Yeager at the North Dakota Agricultural Experiment Station to produce an earlier yellow sweet corn. Sunshine at the time of its introduction was found by several hundred cooperators to be the earliest yellow sweet corn for North Dakota. Professor Yeager, however, continued his breeding work with a cross between Sunshine and Pickaninny which resulted in the production of another variety a week earlier than Sunshine. It was first sent out as Gold Nugget in 1927, but because of name duplication, it was rechristened Golden Gem in 1928 and seed given to seedsmen for trial.



GOLDEN CREAM

(Natural size)



WHIPPLE'S EARLY YELLOW

(Natural size)

At Geneva this variety came into bearing in 61 days, and was usually the earliest yellow variety, although Spanish Gold in some seasons equalled this time or was a day or so earlier. This is 11 days earlier than Golden Sunshine and 17 days earlier than Golden Bantam. The variety can only be considered as a home garden or early market sort, because the small size of the ear and stover render it uneconomical to produce. The plants of Golden Gem are much the shortest of any yellow variety, much more slender and shorter than those of Golden Bantam. The ears are often as long as those of Golden Bantam but are more slender and the plants are not as productive. Dry kernels are distinctly pale yellow as contrasted with the darker dull yellow of Spanish Gold or Golden Giant.

Plant short, $3\frac{1}{2}$ –4 feet; stalks very slender and straight; nodes 6–7, covered, not prominent. Brace roots and tillers usually absent. Leaves very short and narrow, $20\text{--}22 \times 2\frac{3}{4}\text{--}3$ inches, distinctly colored at the margin; sheath longer than internode. Tassel very short and slender, 12–14 inches; terminal spike erect; lateral spikelets nearly erect, few, short, simple, and moderately crowded; bracts green, moderately striped with red; anthers buff color (deep colonial buff to chamois); 46–48 days to anthesis.

Ears borne at 2nd and 3rd nodes, usually one ear per stalk with an additional nubbin usually present. Shank very short and slender, 2–3 inches. Husks few, moderately thick, short, rather tightly wrapped but easily removed. Husked ear moderately short and slender, $6\text{--}7 \times 1\frac{3}{8}\text{--}1\frac{5}{8}$ inches, nearly cylindrical, slightly tapering; tip conical and usually exposed; rows 8–12, straight, regular and crowded around the cob.

Kernels at milk stage moderately light yellow, quite wide and moderately shallow; at dry stage very pale yellow, medium size, moderately broad and short, $.91 \times 1.1 \times .38$ cm. (140 seeds per oz.); short broad oval in shape; crown distinctly rounded; surface quite finely and abundantly wrinkled; set tightly on cob.

Golden Giant, De Lue's. Refs. 56, 72, 100, 124, 141, 335, 344, 373, 466, 478, 488, 499, 506, 521, 525, 562. Syns. Golden Giant, Golden Prize, Golden Wedding.

Golden Giant has been very commonly used as a class name, particularly during the last 10 years when other varieties have been introduced very similar to it in size of ear and in season. Of all the varieties resulting from crosses of Golden Bantam and a white variety, this has proved to be one of the best so far established. The white parent was Howling Mob and the cross was made about 1906 by Dr. Frederick S. De Lue of Needham, Massachusetts. After 10 years selection it was exhibited in 1916 before the Vegetable Committee of the Massachusetts Horticultural Society who for the first time in the history of the Society awarded to a variety of sweet corn its much-sought-for silver medal. The award was made for the best new vegetable introduced in 1916; and certainly the wide use of the variety today shows that the committee were justified in their decision. Joseph Breck & Co. introduced the variety with a full page display in their catalog of 1917.

Eighty-three days were required for this variety to reach edible maturity at Geneva. This was 5 days later than Golden Bantam and 7 days earlier than Bantam Evergreen and Sunnybrook. Plants are about equal in height to Golden Bantam, less inclined to tiller, and

show red on sheaths more abundantly. The husked ears are thicker and larger than 10- to 14-rowed Bantam with kernels larger and more coarse. In the dry stage, the kernels are set more tightly on the cob than are those of Golden Bantam and are decidedly less wrinkled. Golden Giant is used chiefly as a market garden and truck gardening variety and by some commercial canneries.

Plant medium tall, $5\text{--}5\frac{1}{2}$ feet; stalks moderately slender, straight; nodes 9–10, usually covered, not prominent; internodes streaked with red on exposed portions. Brace roots present on one node, slender, occasionally useful, whorl not always complete. Tillers moderately few present. Leaves moderately short and moderately narrow, $25\text{--}26 \times 3\text{--}3\frac{1}{2}$ inches, sheath equal to internode and occasionally longer, very often prominently streaked with red. Tassel medium long and slender, 16–18 inches, terminal spike erect; lateral spikelets both horizontal and slightly drooping, many present, crowded, compound; bracts green, rather heavily striped with red; anthers bronze red (vinaceous russet) and purplish red (van dyke red); 60–63 days to anthesis.

Ears borne at 4th and 5th nodes, one and occasionally two ears per stalk. Shank quite variable, 3–4 inches, moderately heavy but brittle. Husks many, short, rather heavy, rather difficult to remove. Silk abundant, moderately long, easily removed from cob and quite uniformly red in color. Husked ear medium long and plump, $7\text{--}8 \times 1\frac{3}{4}\text{--}2$ inches; slightly tapering, base rounded, slightly enlarged and compressed; tip abruptly conical, and often partly exposed; rows 12–16, usually regular, straight, occasionally irregular at the base.

Kernels at milk stage yellow, medium size and rather shallow. At dry stage amber yellow, medium size, short and thick, $1.0 \times 1.0 \times .41$ cm. (108 seeds per oz.); nearly square in shape; crown slightly rounded; surface sparsely and very shallowly wrinkled; set tightly on cob.

Golden Honey. Refs. 224, 523.

Golden Honey is of the past for the name no longer appears in present-day catalogs. There would seem to be no better name that could be used to describe the combination of color and of quality that can be found upon eating the sweet yellow ears of good corn. The name was first used in 1906 by the Templin Co. of Calla, Ohio, and was given to a variety which from pictures and descriptions was only a reappearance of Golden Sweet. In 1906, Templin said, "Has been known in this section of Ohio among a few families for about 35 years." J. Reynolds Lawrence, Eden Trial Grounds, North Middleboro, Massachusetts, who enjoyed quite a reputation as an experimenter, wrote in 1906 as follows, "I cannot say too much for Golden Honey. It is a sweet corn and no mistake, and not only sweet but of most excellent flavor." The name was not carried by Templin after 1919.

Gregory offered a Golden Honey from 1911 to 1928. This was apparently a 12-rowed sort and, although we have never seen it growing in trial, early descriptions would place it as a close companion to Vick's Golden Nugget.

Golden Leader. Ref. 321.

Minnesota has the reputation for growing good sweet corn. There is evidence of this in the large acreage grown by market gardeners and by canners in that state. The varieties used are quite varied and among them are several not grown elsewhere. A

few of these good varieties have been bred or selected by C. J. Lindholm, a Minneapolis gardener and seedsman.

Mr. Lindholm crossed Quincy Market, which is even more popular on the Twin City markets than in its home territory, with Golden Bantam. This cross was made in 1915 and after 7 years work a hybrid strain was offered to growers as Golden Leader. The parent varieties have ears that are quite individual, so that the combination resulted in a rather attractive new yellow type.

Eighty-two days were required for this variety to reach edible maturity at Geneva. This was identical in season to that of Golden Rod, 4 days later than Golden Bantam, and 8 days earlier than Sunnybrook. The plants are shorter and more inclined to zigzag than Golden Rod, leaves much shorter and more narrow, and tassels shorter and more erect. The ears are more tightly wrapped with husks, while the husked ear is more plump, although of equal length. The dry kernels are smaller, much longer in proportion to the width, and triangular in shape instead of broad ovate. In many respects it resembles Golden Giant, but stalks are more uniformly slender and kernels at milk stage distinctly more narrow. It is used in the Middle West to a considerable extent as a market and home garden variety, and at Geneva has proved to be a very uniform and attractive sort.

Plant moderately tall, 5½-6 feet; stalks moderately slender and slightly zigzag; nodes 9-10, slightly exposed, occasionally prominent; internodes quite heavily shaded with red on the exposed portions. Brace roots present on one node, moderately useful and complete. Tillers moderately many, usually as tall as central stalk. Leaves short and narrow, 23-25 x 2½-3½ inches, sheath slightly shorter than internode. Tassel moderately short, 15-16 inches; terminal spike erect; lateral spikelets nearly erect, short, many present and moderately crowded; bracts green, moderately striped with red; anthers dark reddish brown (vinaceous red to van dyke red); 65-66 days to anthesis.

Ears borne at 3rd to the 5th nodes, usually one ear per stalk with an additional nubbin usually present. Shank short, 2-3 inches, moderately heavy and brittle. Husks moderately long, heavy, tightly wrapped. Husked ear medium long and plump, 7-8 x 1¾-2 inches, moderately tapering; base slightly enlarged and compressed; tip conical and slightly exposed; rows 12-16, regular and straight, occasionally somewhat irregular at the base, crowded around the cob.

Kernels at the milk stage light yellow, rather narrow and shallow; at the dry stage light amber yellow, small, slightly longer than broad, .94 x .85 x .35 cm. (128 seeds per oz.); triangular; crown slightly rounded; surface moderately fine, shallow and abundantly wrinkled, occasionally rather smooth and devoid of much wrinkling; set tightly on cob.

Golden Nugget. Ref. 542. Ann. of Hort. 1892. 171.

Golden Nugget was introduced in 1892 by James Vick's Sons, Rochester, New York, and was received with considerable enthusiasm. This new variety and new type, a 12-rowed yellow sweet corn, differed from the 8-rowed Golden Nugget of Gregory offered in 1893. Until the early twenties the variety remained a distinct and popular sort, but present strains are quite similar to Bantam Evergreen.

Edible ears were produced about 1 week later than Golden Bantam. The plants of Golden Nugget were

about 1 foot taller and more inclined to tiller than Bantam. The husked ears were about the same length, but were more plump and contained 10 to 12 rows instead of 8. Many reports indicate that Golden Nugget was also a much more productive sort. Since the true type no longer exists, definite information relative to this factor must remain untold.

Plant moderately short, 4½-5 feet; stalks slender. Tillers many, nearly as tall as central stalk. Leaves short and narrow, 22-24 x 2¾-3 inches, sheath equal to and occasionally shorter than internode. Tassel medium long and moderately slender, 14-16 inches, usually colored at the base; terminal spike moderately erect, lateral spikelets erect to slightly drooping.

Ears borne 3rd to 5th nodes, often two ears per stalk and an additional nubbin present. Shank medium long and slender, 3-4 inches long. Husks medium in number, thin, short, moderately tight wrapped and rather easily removed. Husked ear moderately short and moderately plump, 6-7 x 1¾-1¾ inches; moderately tapering, base compressed, tip sharply conical; rows 10-12, moderately straight, slightly irregular at the base, crowded around the cob.

Kernels at milk stage yellow, medium size, rather shallow; at dry stage amber yellow, broad as long; ovate, crown slightly rounded, surface moderately wrinkled; set moderately tight on cob.

Golden Orange. Ref. 57.

This variety offered by Thomas W. Emerson Co. of Boston in 1914 and by Joseph Breck & Sons in 1919 was developed by George S. Steele, a progressive grower farming at Hudson, New Hampshire.

At Geneva 72 days were required to reach edible maturity, in season with Golden Sunshine, 4 days later than Golden Early Market, and 6 days later than Golden Dawn. The plants and ears most resemble those of Golden Dawn (Breck), the former being slightly taller and inclined to produce tillers considerably shorter. The husked ears of Golden Orange are slightly shorter and plumper, whereas the kernels are inclined to be deeper orange yellow in color. In the dry stage, the kernels are more triangular in shape, whereas those of Golden Dawn are short and broad ovate. The variety is used primarily as a home and market garden sort in the New England states where it helps to fill the gap between the extreme earlies and the regular Golden Bantam.

Plant moderately tall, 5½-6 feet; stalks medium heavy, slightly zigzag; nodes 8-9, usually exposed and prominent. Brace roots absent. Tillers moderately many, usually half as tall as central stalk. Leaves medium long and moderately broad, 28-30 x 3½-4 inches; sheath shorter than internode. Tassel medium long and slender, 16-18 inches; terminal spike erect; lateral spikelets horizontal, medium long, moderately many, and crowded; bracts pale green moderately striped with red; anthers buff (deep colonial buff to chamois); 54-56 days to anthesis.

Ears borne at 3rd and 4th nodes, one and very often two ears per stalk; shank moderately long and slender, 4-5 inches. Husks moderately many, medium long, rather loosely wrapped and easily removed. Husked ear medium long and plump, 7-8 x 1¾-2 inches, partly cylindrical and slightly tapering; base rounded and compressed; tip abruptly tapering; rows 12-14, straight, regular and crowded around the cob.

Kernels at milk stage deep yellow, soon assuming an orange yellow tint, large, broad and rather thick; at dry stage nearly broad as long, 1.0 x 1.05 x .43 cm. (92 seeds per oz.); roughly triangular; crown slightly rounded; surface rather abundantly and deeply wrinkled; set tightly on cob.

Golden Rod. Refs. 30, 261, 525, 562.

Introduced in 1911 at a time when the yellow-grained varieties were slowly but steadily gaining in favor, Golden Rod was decidedly of high quality and a meritable acquisition to the Bantam family. The cross between the parent varieties Golden Bantam and Stowell's Evergreen was made in 1906 at the Baldwin, Long Island, trial grounds of Peter Henderson & Co. of New York. This variety has the same parentage as Bantam Evergreen, but as shall be noted when the two varieties are compared, the recombination of characters resulted in two radically different types. For many years Golden Rod, Golden Cream, Bantam Evergreen, and Golden Bantam made up the "Big Four" of yellow varieties.

Eighty-two days were required for this variety to reach edible maturity at Geneva. This was practically the same season as Golden Giant, 4 days later than Golden Bantam, and 8 days earlier than Bantam Evergreen. The plants of this variety most resemble those of Carpenter's Giant Golden Sweet, whereas the husked ears are much like those of Sunnybrook, being slightly shorter and usually averaging two more rows. The variety has been advanced as a mid-season variety of the large Bantam type. It is used primarily as a market garden and home garden sort where the demand is for a larger ear.

Plant tall, $6\frac{1}{2}$ -7 feet; stalks moderately heavy and straight; nodes 9-10, exposed, prominent. Brace roots present and complete on one node. Tillers many, slightly shorter than central stalk. Leaves long and moderately broad, $32-34 \times 3\frac{1}{2}-4$ inches; sheath distinctly shorter than internode. Tassel long and very slender, 22-24 inches; terminal spike slightly drooping; lateral spikelets drooping and somewhat spreading, long, many present, crowded; bracts pale green, very sparsely striped with pale red; anthers buff color (chamois to deep colonial buff); 60-62 days to anthesis.

Ears borne at 4th and 5th nodes, very often two ears per stalk. Shank quite variable in length, rather tough. Husks moderately many, long and rather loosely wrapped. Husked ear medium long and moderately plump, $7-8 \times 1\frac{5}{8}-1\frac{3}{4}$ inches, moderately tapering, base enlarged; tip conical and usually exposed; rows 10-14, occasionally paired and irregular at the base, usually crowded around the cob.

Kernels at milk stage light orange yellow, moderately wide and shallow; at dry stage bright orange yellow, moderately large, usually broader than long, $1.04 \times 1.17 \times .39$ cm. (104 seeds per oz.); short, very broad ovate in shape; crown distinctly rounded; surface moderately fine and abundantly wrinkled although somewhat variable in this respect; set moderately tight on cob.

Golden Sunrise. Ref. 317.

In the collection of newer varieties Golden Sunrise is outstanding in the large-eared group of varieties. H. S. Mills, a former member of the staff of Cornell College of Agriculture, is responsible for its origin. Mr. Mills supervised the corn breeding work at the Long Island Vegetable Research Farm, Riverhead, New York, and in 1925 produced this promising sort by field crossing Golden Bantam and Long Island Beauty. Selection for type was made in 1926 and continued until 1928. In 1929, the stock seed was moved by permission from Cornell University to Bristol, Pennsylvania, at which time Mr. Mills was employed by the D. Landreth Seed Co. Selections continued and in

1931, when the type was well fixed, the D. Landreth Seed Company first offered it as Golden Sunrise.

At Geneva edible ears were produced in 81 days, 3 days later than Golden Bantam and 9 days earlier than Bantam Evergreen. The plants of this variety are the most vigorous of all yellow varieties of major importance, being taller than Bantam Evergreen or Whipple's Yellow and as stout as Bantam Evergreen, with foliage more abundant and somewhat lighter green. The variety is of too recent origin to be adequately judged. Limited trials, however, have indicated its possibilities as a canning and market garden variety of more than ordinary quality.

Plant tall, $7\frac{1}{2}$ -8 feet; stalks straight and moderately heavy; nodes 10-12, usually somewhat exposed, moderately prominent. Brace roots present and complete on one node, moderately heavy and useful. Tillers usually absent, occasionally a very few but always shorter than the central stalk. Leaves long and broad, $32-34 \times 4-4\frac{1}{2}$ inches; sheath equal to and often slightly shorter than the internode. Tassel long and heavy, 20-22 inches; terminal spike erect; lateral spikelets drooping, many present, moderately long, and rather crowded; bracts light green, moderately striped with dark red; anthers buff color (deep colonial buff); 64-65 days to anthesis.

Ears borne at the 4th and 5th nodes, one ear per stalk with an additional nubbin present. Shank variable, 2-5 inches, slender. Husk leaves many, short and light; husks many and thick, rather tightly wrapped, medium long. Husked ear moderately long and plump, $8-10 \times 1\frac{3}{4}-2$ inches, moderately to decidedly tapering; base enlarged and usually compressed; tip conical; rows 12-14, usually straight but often somewhat irregular at the base.

Kernels at milk stage bright to orange yellow, medium in size and moderately deep; at dry stage dull yellow, medium width and thickness, moderately long, $1.1 \times .85 \times .37$ cm. (148 seeds per oz.); triangular in shape; crown slightly rounded; surface heavily and rather deeply wrinkled; set loosely on cob.

Golden Sweet. Refs. 17, 61, 73, 87, 89, 91, 93, 121, 214, 217, 220, 223, 241, 298, 308, 312, 348, 350, 397, 406, 412, 429, 503, 507, 508, 512, 513, 536, 537. Syns. Early Yellow New England, Golden, Golden Early Yellow, Golden Sugar, Golden Yellow, Yellow.

The date when this name became associated with the sub-variety mentioned by Salisbury in 1848 as "a new variety made by crossing the Sweet with the Early Canada" is as unknown as the originator and introducer. The idea of its origin was recognized by Burr, 1863, who said, "apparently a hybrid between Common Yellow or Canada Flint and Darling's Early."

From the records of J. J. H. Gregory & Son of Marblehead, Massachusetts, there is evidence that a Golden Sweet was sent out in 1865. This was a very early bright golden yellow sort. The catalog of 1885 gives this short but apt description: "Golden Sweet: The only cross ever made between the sweet and field varieties; flavor, peculiarly rich." A few years after the original introduction the seed stock was lost, but in 1875 a new source was found. The demand for a golden sweet was very limited and about 1887 the name had disappeared from their catalog.

In 1893 a new name appears in Gregory's list, "Golden Nugget." "We find this to be the variety catalogued years ago, under the name of Golden Sweet.

Though not new, it has some good characteristics, peculiar to itself. We refer to its bright golden color, and a rich flavor suggesting a cross between the field and sweet corn, which is very agreeable to most persons."

The Golden Sweet was also listed in 1868 by Hovey & Company of Boston, who described it as a "hybrid between common yellow and Darling's Early; tender, sweet but less sugary than most sweet varieties." It was described the same year by Curtis & Cobb. Today it does seem strange that this yellow type now represented by Golden Bantam, the acknowledged leader of all sweet corn, was ignored in favor of white varieties now considered inferior in quality.

Plant moderately short, $4\frac{1}{2}$ -5 feet, stalks slender. Ears borne low on plant; husked ears moderately short and moderately slender, $6-8 \times 1\frac{1}{2}-1\frac{3}{4}$ inches, cylindrical or slightly tapering. Rows 8-10, regular and straight. Kernels at dry stage "semi-transparent yellow," large, broad as long, 121 seeds per oz.; crown rounded, nearly semi-circular; surface moderately wrinkled.

Jewell Bantam. Ref. 146.

Comstock, Ferre & Co., of Wethersfield, Connecticut, purchased, in 1922, a small quantity of seed of a hybrid corn from a local farmer. After 3 years trial and reselection they introduced it as Jewell Bantam. The cross had been accidental and was between Golden Bantam and Evergreen, giving ears which were of good golden color but markedly different from the Bantam in size and shape. It has been offered since 1927 by R. B. Dunning & Co. of Bangor, Maine.

At Geneva edible maturity was obtained in 77 days, approximately the same as Golden Bantam, 5 days later than Golden Sunshine, and 5 days earlier than Barden's Wonder Bantam. The plants are practically identical to those of Barden's Wonder Bantam although less inclined to tiller. The husked ears are slightly shorter than Barden's and plumper, containing 10 to 14 rows instead of 8 to 10. The kernels in the milk stage are narrower but about the same depth; in the dry stage they are usually less wrinkled and distinctly tighter set on the cob. The variety is used for those whose trade demands a fairly large sized ear early in the season. Its use therefore is largely confined to home and market gardeners. Its increased vigor over that of regular Golden Bantam renders it as a possibility in those areas where the latter variety does not perform satisfactorily.

Plant moderately tall, $5\frac{1}{2}$ -6 feet; stalks moderately slender and straight; nodes 9-10, exposed and prominent. Brace roots slender, moderately useful, whorl complete on one node. Tillers moderately many. Leaves medium long and moderately broad, $28-30 \times 3\frac{1}{4}-3\frac{3}{4}$ inches; sheath shorter than and occasionally equal to internodes. Tassel medium long and slender, 16-18 inches; terminal spike erect; lateral spikelets quite drooping, moderately long and abundant; bracts green, sparsely striped with red. Anthers light yellow and buff (pinard yellow to chamois); 68-70 days to anthesis.

Ears borne at 3rd and 4th nodes, usually one ear per stalk with an additional nubbin present. Shank moderately long, 4-6 inches, heavy and brittle. Husks moderately many, medium long and rather tightly wrapped. Husked ear medium long and moderately plump, $7-8 \times 1\frac{1}{2}-1\frac{3}{4}$ inches, partly cylindrical, rather sharply tapering near tip; base slightly enlarged and tip conical, occasionally capped; rows 10-14, regular, straight and crowded around the cob.

Kernels at milk stage light golden yellow, medium width (some-

what wider on the 10-rowed specimens), and rather shallow; at dry stage broader than long, $.92 \times 1.1 \times .38$ cm. (120 seeds per oz.); somewhat triangular in shape; crown rounded; surface moderately wrinkled, often quite finely so, rather shallow; tightly set on cob.

Kingscrost. Refs. 210, 498. Syn. Double Crossed Golden.

Northrup, King & Co. offered this new hybrid-inbred as Double Crossed Golden in 1930, but in 1933 renamed it Kingscrost. It was featured by R. L. Gould & Co., St. Paul, Minnesota, and by Francis C. Stokes & Co. in 1933 as a new departure in yellow sweet corn with uniformity in growth and in maturity of the ears.

This is a sweet corn that is doubly new. For nearly a hundred years we have had new varieties introduced that were the products coming from crosses between two well-established sorts. For themselves many of these parent stocks did not represent pure lines. If they could have been dissected for all of the many characters possessed by a corn plant, there would have been found not consistency for these characters, but its very opposite, variability. Therefore, when two parents having variation for the separate characters, were crossed, the hybrid or progeny would again tend to be even more variable.

Nowadays, in order to produce a new stock, the plant breeder may first self-fertilize parent strains and after several generations produce inbred or pure lines. The crossing of two inbred strains produces in the first generation a hybrid-inbred with plants that are uniform in their many characters. This program is now being carried out by many corn breeders and in the future many new varieties so produced may be offered. The inbred lines are controlled by the originator, necessitating the renewal of the seed stock each year from the original parent lines.

Edible maturity was obtained at Geneva in 70 days, 8 days earlier than Golden Bantam and 9 days later than Golden Gem. The plants were more like Golden Gem than Golden Bantam, consistently producing more tillers than either variety and stalks more slender than the latter. The husked ears were inclined to be more noticeably paired than those of Golden Bantam, but otherwise the ears were very similar. Its uniformity both in plant and ear characteristics render it a distinct contribution to the home and market gardener.

Plant short, $4-4\frac{1}{2}$ feet; stalks slender, slightly zigzag; nodes 6-7, usually exposed, prominent. Brace roots absent. Tillers distinctly many, nearly as tall as central stalk. Leaves short and narrow, $18-22 \times 2\frac{3}{4}-3$ inches, uniformly red on the margin; sheath shorter than internode. Tassel short and slender, 12-15 inches, occasionally red at the base; terminal spike erect; lateral spikelets nearly erect, short, stiff, few present and scattered; bracts green, moderately striped with red; anthers uniformly dull reddish bronze (terra cotta); 51-52 days to anthesis.

Ears borne at 2nd and 3rd nodes, one ear per stalk with an additional nubbin present, small ears often borne on the tillers. Shank medium long and slender, 4-5 inches. Husks medium in number and length, rather tightly wrapped but easily removed. Husked ear medium long and slender, $7-8 \times 1\frac{3}{4}-1\frac{5}{8}$ inches, partly cylindrical and slightly tapering; base slightly expanded, tip conical and exposed; rows 8, somewhat distinctly paired, moderately straight, slightly irregular at the base, not crowded around cob; furrows deep but rather narrow.

Kernels at milk stage bright orange yellow, rather small, shallow and medium width; at dry stage, dull orange yellow, broader than long, .84 x 1.0 x .35 cm. (104 seeds per oz.); short broad ovate; crown rounded; surface abundantly and rather finely wrinkled; set moderately tight on cob.

Nuetta. Refs. 242, 335, 556, 557. Syn. Indian Sweet.

This is one of the few varieties of sweet corn that can be traced back to an Indian source. Oscar H. Will & Co., Bismarck, North Dakota, were the introducers, having secured seed from a Mandan Indian at Elbowoods, in 1912. It was first called Indian Sweet Corn. In 1919 Will named many of his other introductions from Indian sources after some tribal name of the Indians of the St. Berthold Reservation. To carry out this policy Indian Sweet was renamed Nuetta, the Indian word for Mandan. Although Nuetta can be traced back to native Indian cultivation, it differs from other types that have been described. The kernel in the dry state is dark red in color, but when harvested for boiling it is a rather light yellow. It is also unlike any other in that whereas the dry kernels are a dark red color the glumes and cob are white. It thus differs from the variety known as Number 20, page 302, in Will's book *Corn Among the Indians*, which had a white cob with a red ring about the edge of the pith (glumes). It also differs in this same respect from the near-white varieties having reddish seed in the dry stage, such as Narragansett, Marblehead, Dighton, and Aristocrat.

Seventy-seven days were required to produce edible ears at Geneva. This was 6 days earlier than Golden Giant, about the same season as Golden Bantam, and 8 days later than Dighton. Nuetta produces plants that are about 1 foot shorter than those of Golden Bantam and slightly taller than those of Dighton. It has a greater tendency to tiller than the former, is more prominently and more uniformly shaded with red, and has decidedly deeper purplish red anthers. The husked ears are slightly longer and kernels in the milk stage are much lighter yellow than Golden Bantam, but in the dry stage they assume a much more intense reddish bronze than those of Golden Age. Portions of the kernels, however, retain a yellowish cast common to that of most yellow varieties at a comparable stage. The variety has been subsequently developed for the Northern Plains area where its earliness and resistance to somewhat adverse weather conditions has given it a place of limited importance. It is not widely known nor is it believed to be cataloged by anyone but the introducer.

Plant moderately short, 4-4½ feet; stalks slender, moderately straight; nodes 7-8, usually covered, not prominent; internodes shaded with light red at the base of nodes and exposed surfaces. Tillers many, slightly shorter than central stalk. Brace roots absent, plant easily blown over. Leaves short and narrow, 24-26 x 2¾-3 inches, colored red at the margin; sheath equal to and occasionally shorter than internode. Tassel moderately short and slender, 14-15 inches, usually colored at the base; terminal spike erect; lateral spikelets nearly erect, medium in number, short, simple; bracts variable in red stripping, ringed at the base; anthers very uniformly deep red (bordeaux); 58-60 days to anthesis.

Ears borne at 3rd and 4th nodes, one and occasionally two

ears per stalk, husks moderately few, short, tightly wrapped and difficult to remove. Husked ear medium long and moderately slender, 7-8 x 1¼-1⅝ inches, moderately tapering; base slightly enlarged and compressed; tip conical and exposed; rows 8, somewhat irregular, crowded around the cob.

Kernels at milk stage deep cream (maize yellow), large, very broad and moderately deep; at dry stage deep brownish red (hayes russet) with portions of the crown much lighter (mars yellow); wider than long, 1.01 x 1.27 x .39 cm. (96 seeds per oz.); short oval in shape; crown rounded, usually somewhat crease-dented with one-half of the surface usually higher than the other; surface sparsely and coarsely wrinkled; set moderately tight on red cob.

Papago. Refs. 198, 228, 375, 549. Syn. Papago Sweet. Illus. 25.

The catalog descriptions of Papago corn often allude to the variety as the prehistoric sweet corn of the Indians of Arizona and New Mexico. It is possible that among some of the very early dwellers of the arid Southwest there did exist a definite variety of sweet corn, but such is not to be found today. This particular variety, Papago, instead of coming directly as a kind grown by the Indians, resulted from the intensive selection program of G. F. Freeman, plant breeder at the Arizona Experiment Station.

Prof. Freeman, realizing the impossibility of securing really high grade green sweet corn for table use in Arizona until it could be grown in the state, was attracted to a few ears of a true southwestern Indian or Squaw corn which contained a number of wrinkled sweet grains. The discovery was made while visiting the Papago Indian villages in the desert valleys of southern Arizona between the Baboquivari and Quizotoa Mountains. Originally, the seed came from two ear types varying in size, depth of kernel and susceptibility to worm injury and molds. The few grains secured were planted in 1910, the same year they were found, and produced 2 ears of the large type and 20 of the smaller. Plant breeding methods were followed to bring the size of the ear and the grain up to standard and in 1915 the improved strain was so far superior to the unacclimated eastern sorts that its introduction as Papago Sweet was well justified.

At Geneva 117 days were required for this variety to reach edible maturity. This was by far the latest maturing sweet corn, either yellow or white, in any of the Geneva trials. This was 27 days later than Bantam Evergreen and Sunnybrook, the two late season varieties usually grown for market in New York. The plants were slightly taller than Mills' Golden Sunrise, much more leafy and with a more bushy tassel. The husks are more tightly wrapped than any other sweet corn, thereby rendering it nearly immune to corn ear worm infestation. The kernels are decidedly thicker and more shallow than any other sweet variety. It has no importance in this section of the country, although in the semi-arid regions of the Southwest it has been reported to yield well and possess considerable drought resistance.

Plant very tall, 8-8½ feet; stalks moderately heavy and straight; nodes 12-14, covered, not prominent; internodes shaded with solid red on exposed portions. Brace roots present and complete on one and two nodes, useful. Tillers many present, nearly as tall as central stalk. Leaves long and moderately narrow, 36-38 x

2 $\frac{3}{4}$ –3 $\frac{1}{2}$ inches; midrib quite broad, deeply furrowed and prominent; sheath distinctly longer than internode. Tassel long and slender, 18–20 inches, not colored at the base; terminal spike erect; lateral spikelets nearly erect to slightly drooping, many, moderately long, rather crowded and usually simple; bracts pale green striped with dark green and occasionally ringed with red at the base; anthers uniformly yellow (pinard yellow); 85–90 days to anthesis.

Ears borne at 7th and 8th nodes, usually one ear per stalk with one or two nubbins usually present. Shank short, 2–3 inches, slender but moderately tough. Husk leaves occasionally few present, very short and light. Silk abundant, medium long and red in color, fairly easy to remove. Husked ear moderately long and moderately slender, 8–9 x 1 $\frac{1}{2}$ –1 $\frac{3}{4}$ inches, nearly cylindrical with slight taper near tip; base rounded and somewhat tapering; rows 16–18, regular, straight, distinctly crowded around cob.

Kernels at milk stage pale yellow, small, medium depth but narrow and thick; at dry stage almost lemon yellow, narrow, short and thick, .82 x .74 x .38 cm. (225 seeds per oz.); distinctly triangular; crown slightly rounded; surface crease-dented, usually quite smooth except for an abundance of very minute wrinkling of the seed coat; set rather firmly, but not crowded.

Red Cob Golden Bantam. Refs. 56, 112. Syn. Briggs' Red Cob Bantam.

The variety of sweet corn first recorded and cultivated by the early New England farmers had one very undesirable quality; that of possessing a red cob which might have stained the table linens. With this in the ancestral background we can understand, how, in 1914, a Mr. Briggs of Newton, Massachusetts, could find an ear of Golden Bantam with a red cob and then could not resist the urge to save it and attempt to develop something new. Joseph Breck & Sons, first listed it in 1917 as a rather early variety of extreme sweetness and tenderness. Grey, Childs, and Stumpp & Walter offered it in 1919. The edible ears were very similar to ears of Golden Bantam, but in the dry stage could be differentiated by the presence of a red cob and kernels with a crimson hue.

Spanish Gold. Refs. 115, 118, 119, 540.

The variety resulted from a program of crossing sweet corn started in 1924 at the Connecticut Agricultural Experiment Station at New Haven. One parent, characterized by a dark green sturdy plant bearing short well-filled ears with 12 to 16 rows of bright corneous kernels, came from the Pyrenees Mountains of Spain. That ancestor, a flint, grew near the sky on sunny slopes where spring comes late and winter comes close to summer. It was called "Cinquantino" after the Spanish word for 50th on which day it was reputed to ripen.

This variety, in all probability, is the same as that reported in the United States Department of Agriculture Annual Report for 1854, as follows:

"Forty Day Maize (Mais Quarantain), a dwarf variety from the south of Spain, reputed once to have ripened high up in the Alps in forty days after planting. The object in introducing this grain in the United States was on account of its quick growth, early maturity and sweet flavor in the green state, as well as the delicacy of the bread made from its meal. Besides, it appears to be well adapted to the high latitudes and elevated valleys in many parts of the country, where most of the other varieties of corn will not thrive, and with a chance of a successful result in crossing it with the

larger sorts, to which it might impart in a degree, its quality of early ripening if not its taste."

To obtain that earliness and vigor, the amber Spanish corn Cinquantino was crossed with Crosby, Golden Bantam, Whipple's Yellow, Golden Giant, and Black Mexican. The seed of the hybrids having all yellow, sugary kernels were mixed and grown in one field in 1928 and allowed to interpollinate naturally. The process of selecting the earliest plants producing one good sized ear was continued for 3 years. "The Latin-Yankee union proved, like so many exotic mixtures, to foster a genius. The progeny matured remarkably early and was good to look upon and delicious to eat." The name Spanish Gold was chosen previous to its introduction in 1932 by F. H. Woodruff & Sons.

Edible ears were obtained at Geneva in 62 days, 10 days earlier than Golden Sunshine and 1 day later than Golden Gem. Plants of this variety were quite individual, possessing stalks much more zigzag and nodes more prominent than those of any other sort. Considerably more red was present on the sheath and margins of the leaves as well as on the exposed portions of the internode. The husked ear is more plump, contains more rows, but is about equal in length to Golden Gem. The variety is of too recent origin to have established a definite utility among the various groups of growers. Its extreme earliness and increased size of ear in comparison to other varieties in its class, however, qualifies it for a thorough test.

Plant medium tall, 5–5 $\frac{1}{2}$ feet, stalks slender and distinctly zigzag; nodes 7–8, exposed, prominent, internodes shaded with red over exposed portions. Brace roots present and complete on one node, very slender. Tillers few to none, often terminate with a small ear. Leaves medium short and narrow, 24–26 x 2 $\frac{3}{4}$ –3 inches, colored at the margin; sheath much shorter than internode. Tassel moderately long and slender, 18–20 inches, terminal spike erect; lateral spikelets moderately erect to horizontal, few present, moderately short and scattered; bracts green, distinctly striped with dark red, also ringed at the base with the same color; anthers mixed; 48–50 days to anthesis.

Ears borne at 3rd and 4th nodes, one ear per stalk with an additional nubbin usually present. Husks few, quite heavy, moderately long and tightly wrapped. Husked ear moderately short and moderately plump, 6–7 x 1 $\frac{3}{4}$ –1 $\frac{7}{8}$ inches, slightly tapering; tip abruptly conical; rows 12, regular, straight, crowded around the cob.

Kernels at milk stage light yellow, small, thick, and fairly deep; at dry stage bright yellow, short and narrow, .93 x .90 x .42 cm. (136 seeds per oz.); usually triangular; crown slightly rounded; surface rather finely and abundantly wrinkled; set moderately tight on cob.

Sunnybrook. Refs. 83, 348.

The twin sister variety to Burpee's Delicious (white) came from the garden of Herbert Hoffman of Merchantville, New Jersey. In the fall of 1916, while stripping off some seed ears in a patch of Golden Bantam, Dr. Hoffman found an ear which showed all the characteristics of that variety but which had a few white kernels on it. The white kernels were separated from the yellow and planted separately the next year. Both came perfectly true and, while the ears grew considerably larger than those of Bantam, the twin sports had the same meaty, luscious sweet flavor of the parent.

The introduction of the yellow selection as Sunnybrook in 1924 was brought about by Burpee.

Edible ears were produced at Geneva in 90 days, in season with Bantam Evergreen, 1 week later than Golden Giant, and 2 days later than Golden Cream. Only one other yellow variety, a minor one, Papago, required longer to reach edible maturity. Plants are shorter than those of Bantam Evergreen, although the tassel was distinctly long and slender in proportion to those of the taller varieties. The husked ear was equal in length to Bantam Evergreen but much more tapering. The ears most resemble those of Buttercup, but possessed more rows and more narrow kernels. The variety is used primarily as a market and home garden sort, coming into production at a time when the earlier, smaller growing yellow varieties have completed their normal season.

Plant moderately tall, 5½–6 feet; stalks moderately slender and straight; nodes 9–10, covered, not prominent. Brace roots present, moderately heavy with whorl complete on one node, vestigial on the second node. Tillers few. Leaves long and moderately broad, 30–34 x 3½–4 inches; sheath longer than but occasionally equal to the internode. Tassel distinctly long and moderately slender, 20–22 inches; terminal spike moderately drooping; lateral spikelets drooping, moderately long, many present and crowded; bracts pale green, sparsely striped with red; anthers buff color (deep colonial buff to chamois); 66–68 days to anthesis.

Ears borne at 5th and 6th nodes, one ear per stalk with an additional nubbin present. Shank moderately long, 4–6 inches, heavy but brittle. Husk leaves many, short and light; husks moderately many, long, heavy and wrapped rather loosely. Husked ear moderately long and moderately plump, 8–9 x 1⅝–1¾ inches, moderately tapering, base slightly enlarged, compressed; tip conical, slightly exposed; rows 10–12, moderately straight, occasionally somewhat irregular at the base, crowded around the cob.

Kernels at milk stage yellow, moderately narrow and medium depth; at dry stage bright amber yellow, moderately large, long and medium width, 1.18 x 1.03 x .39 cm. (104 seeds per oz.); triangular in shape; crown very slightly rounded; surface quite deeply and abundantly wrinkled and creased; set loosely on cob.

Sunshine. Refs. 194, 209, 335, 345, 346, 347, 348, 478, 559, 570, 571. Syns. Early Sunshine, Gold Standard No. 5, Golden Sunshine. Illus. 25.

At the North Dakota College of Agriculture, A. F. Yeager, in 1919, saw the need for his region of a variety earlier than Golden Bantam and with a larger ear. Based on the records of a previous trial three large-eared, extra early white sorts were chosen and planted in alternate rows with Golden Bantam. All of the plants in the rows of white corn were detasseled, thus insuring a cross with Golden Bantam. Long before harvest it became evident that Gill's Early Market was preferable as the other parent. This is a 12-rowed white variety of fair quality selected out of Portland Market by Gill Bros. of Portland, Oregon. Portland Market originally was selected from Mammoth White Cory.

For 6 years Professor Yeager carried along the progeny of this cross using the modern methods of the corn breeder to isolate the line which seemed to have the most desirable characteristics. The 1923 season lots were reduced to seven and the next year one of the seven lots was chosen as superior to all others. Some of the seed secured was sent out in a limited way for trial

in 1925, but the first wide-spread testing came in 1926. Since then, because of its earliness and size of ear, Sunshine has been considered one of the leading yellow varieties.

At Geneva Sunshine produced edible ears in 72 days. This was 6 days earlier than Golden Bantam and 10 days later than Spanish Gold and Golden Gem. Plants were slightly taller than those of Golden Bantam and decidedly more bushy and leafy. Stalks were more zigzag and nodes more inclined to be exposed and prominent. The ears averaged an inch longer, were more plump, and possessed 10 to 12 rows instead of 8. Kernels at the edible stage were somewhat lighter yellow in color, more narrow, and deeper, while the dry seeds were slightly less finely wrinkled.

This variety met with success in many sections of the country. It possesses that invaluable characteristic of fulfilling requirements as a desirable market gardening variety because of its extreme earliness and good quality, as a possible major canning type because of its quality and size of ear, and as an enviable home garden variety since it can be used satisfactorily for a diversity of purposes.

Plant medium tall, 5–5½ feet, stalk moderately slender and straight; nodes 7–9, usually exposed and prominent; exposed portions usually streaked and blotched with red. Brace roots present on one node, whorl complete, moderately slender and useful. Tillers few present. Leaves moderately short and moderately narrow, 26–28 x 3–3½ inches; sheath usually shorter than internode. Tassel medium long and heavy, 14–16 inches, not colored at the base; terminal spike erect; lateral spikelets erect to slightly drooping, many present, crowded, basal ones usually compound; bracts green, slightly striped with light red; anthers buff colored (deep colonial buff to chamois) moderately uniform; 54–56 days to anthesis.

Ears borne at 2nd and 3rd nodes, one ear per stalk with an additional nubbin usually present. Shank variable, 2–6 inches, moderately slender and brittle. Husk leaves many, moderately stiff and distinctly darker green than husk. Husks many, heavy, wrapped rather loosely, easy to remove. Silk scanty, medium long and easily removed. Husked ear medium long and moderately plump, 7–8 x 1¾–2 inches, partly cylindrical, moderately tapering; base rounded and tip conical; somewhat exposed; rows 10–12, regular, straight and crowded around the cob.

Kernels at milk stage light yellow; medium size, moderately broad and medium deep; dry stage light yellow, medium size, .94 x 1.07 x .39 cm. (128 seeds per oz.); somewhat triangular in shape; crown slightly rounded; surface slightly rough, extremely wrinkled; set tightly on cob.

Sweet Orange, Seymour's. Refs. 81, 225, 335, 348, 373, 520, 525, 546. Syns. Burpee's Sweet Orange, Large Golden Bantam. Illus. 25.

This was the second yellow sweet corn which W. Atlee Burpee offered or introduced. The first trial at the Fordhook Farms during the 1905 season gave results so favorable that Mr. Burpee contracted with the originator, H. J. Seymour, a member of the Oneida Community at Kenwood, New York, for his entire supply of seed to be produced during the 1906 season. Sweet Orange was first introduced in 1907 as a second early, to serve as the main crop yellow corn. Burpee stressed its quality, even pronouncing it superior to Golden Bantam in sweetness and tenderness (if one could believe such to be possible).

Edible ears were produced at Geneva in 75 days, 3 days earlier than Golden Bantam, 5 days earlier than Carpenter's Giant Golden Sweet, and 3 days later than Golden Sunshine. Sweet Orange is individual in several characters, one of which is in respect to the orange-colored kernels at milk stage. Although quite sweet, unfavorable criticism has been voiced due to the shallowness of the kernels and the presence of long glumes. The variety most resembles Carpenter's Giant Golden Sweet. The plants are about a foot shorter and more slender. The ears tend to be more slender, containing 2 to 4 less rows with kernels that are much more intense orange color at the milk stage.

Plant medium height, 5-5½ feet; stalks moderately slender and straight; nodes 9-10, covered, not prominent. Brace roots usually absent. Tillers many, slightly shorter than central stalk. Leaves medium long and moderately broad, 28-30 x 3½-4 inches; sheath longer than internode. Tassel medium long and heavy, 15-18 inches, somewhat feathery; terminal spike erect; lateral spikelets slightly drooping, long, compound and evenly distributed; bracts green rather sparsely striped with red; anthers pale reddish bronze (terra cotta); 63 days to anthesis.

Ears borne at 4th and 5th nodes, one and occasionally two ears per stalk; shank short and slender, 2-3 inches. Husk leaves few, short and light. Husks many, medium long and loosely wrapped, easily removed. Husked ear medium long and moderately slender, 7-8 x 1½-1¾ inches, moderately tapering; base enlarged and compressed; tip conical and slightly exposed, occasionally capped; rows 10-14, moderately straight, often slightly spiral, and irregular at the base, crowded around the cob.

Kernels at milk stage orange yellow, small, narrow and shallow; at dry stage deep orange, short and thick, .85 x .8 x .38 cm. (132 seeds per oz.); triangular in shape; crown rounded; surface finely and abundantly wrinkled; set slightly loose on cob.

Whipple's Early Yellow. Refs. 104, 247, 335, 345, 346, 347, 348, 478, 480, 525. Syns. Golden Delicious, Whipple's Yellow. Illus. 81.

To Silas Whipple of Norwich, Connecticut, all good lovers of sweet corn are truly indebted, for the strains that came as a result of his careful work are two of the most popular varieties grown. Joseph Harris Co. of Coldwater, New York, introduced Whipple's Early White in 1919, and first offered Whipple's Early Yellow in 1921. Mr. Whipple had always grown and selected his own seed corn and when, after many years work, he perfected Whipple's Early White, he proceeded to make this good white corn yellow. Rows of the white were planted alternately with Golden Bantam and the tassels of the white pulled out before the pollen was shed. The ears produced on the Whipple's Early White plants were all yellow and some that were exhibited took first prize at the county fair. Seven years were needed to eliminate all the white characters from this corn. Mr. Whipple writes, "I crossed it but once because it would inherit the small ear and short kernel of the bantam in a double portion."

At Geneva edible ears were produced in 75 days, 3 days earlier than Golden Bantam and 3 days later than Golden Sunshine. The plants of this variety are the most vigorous of all early yellow sorts; about 1 foot shorter than Bantam Evergreen, with stalks more slender and less inclined to tiller. Ears are borne lower on the stalk but are of equal size. In the dry stage,

kernels are decidedly more tightly set and, although abundantly wrinkled, are not crease-dented as in Bantam Evergreen. Whipple's Yellow has maintained for several years a position of importance among truck crop producers. Its earliness and abundant yield of large yellow ears have rendered it most acceptable to the market gardener.

Plant moderately tall, 6-6½ feet, moderately slender, slightly zigzag; nodes 9-10, exposed, prominent; internodes occasionally streaked with red on exposed portions. Brace roots present on one node, moderately slender, useful and whorl complete. Tillers few present. Leaves moderately long and moderately broad, 30-32 x 3½-4 inches; sheath shorter than internode. Tassel moderately long and heavy, 18-20 inches; terminal spike nearly erect, lateral spikelets both erect and moderately drooping, many present, crowded and usually simple although the basal ones often compound; bracts green, moderately striped with red; anthers buff colored (deep colonial buff to chamois); 58-60 days to anthesis.

Ears borne at 4th and 5th nodes, one and very often two ears per stalk; shank variable, 3-8 inches long, usually quite heavy but brittle. Husks moderately many, heavy, rather short, wrapped rather tightly but fairly easy to remove. Silk red in color, moderately abundant and long, easily removed from cob. Husked ear large, moderately long and plump, 8-9 x 1¾-2 inches, moderately cylindrical, slightly tapering near the tip; base rounded and compressed; tip broadly conical to nearly rounded; rows 12-16, usually regular and straight, occasionally slightly twisted; crowded around the cob.

Kernels at milk stage light yellow, moderately large, medium width, deep, at dry stage pale yellow, longer than broad, 1.04 x .93 x .40 cm. (140 seeds per oz.); triangular in shape; crown nearly straight, very rough; surface deeply and quite heavily wrinkled; set moderately tight on cob.

Wonder Bantam, Barden's. Refs. 48, 192, 288, 335, 345, 432, 478. Syn. New Wonder Bantam.

C. S. Clark & Sons of Wakeman, Ohio, are one of the largest and oldest establishments growing seed corn in the United States. C. A. Barden of that firm joined the search for a larger Bantam and as one possible source crossed Golden Bantam in 1919 with Early Wonder, an 8-rowed white variety. Four years later the new hybrid Bantam sweet corn was introduced. The continued success of the larger and more vigorous hybrid has made it a contender for the honor of being the most desirable yellow variety introduced since the original Golden Bantam was brought out by Burpee.

Edible ears were produced in 82 days, 4 days later than Golden Bantam and about the same season as Golden Rod. As a whole the variety is a much more vigorous grower than Golden Bantam, will produce a longer ear higher up on the stalk, maintain a greater yield, and in practically the same number of days. In these qualities is derived the basis for its increasing popularity among canners and market gardeners. It most resembles Buttercup, differing from that variety in possessing ears that are slightly more tapering and exposed, and plants that are heavier, darker green, and more inclined to stool. The tillers also bear a larger proportion of marketable ears than does Buttercup.

Plant moderately tall, 5½-6 feet; stalks moderately slender and straight; nodes 9-10, slightly exposed, occasionally prominent; brace roots few present, slender, not very useful. Tillers many, nearly as tall as central stalk. Leaves medium long and moderately narrow, 28-30 x 3½-3¾ inches; sheath equal to and often

shorter than internode, often streaked with red at the base. Tassel medium long and slender, 16-18 inches, occasionally colored at the base; terminal spike erect; lateral spikelets drooping, moderately many, medium long, compound at the base; bracts green, moderately striped with red; anthers buff (chamois); 60-62 days to anthesis.

Ears borne at 4th and 5th nodes, one and occasionally two ears per stalk, tiller often bearing a small one in addition. Shank rather long and heavy. Husked ear moderately long and moder-

ately slender, 8-9 x $1\frac{1}{2}$ - $1\frac{5}{8}$ inches, partly cylindrical and moderately tapering; tip conical, slightly exposed; rows 8-10, usually regular, 8-rowed specimens occasionally paired.

Kernels at milk stage yellow, broad, but rather thin and medium shallow; at dry stage deep yellow, medium size, .98 x 1.1 x .40 cm. (116 seeds per oz.); short, broad ovate, often somewhat triangular; crown rounded; surface rather finely wrinkled, often very shallowly pitted over the entire surface; loosely set on the cob.

OTHER FORMS OF MAIZE USED AS SWEET CORN

The varieties described in the preceding sections as white-kerneled and yellow-kerneled sweet corns are those which truly are classified in the species *Zea Mays rugosa* (sweet corn). It was stated in Chapter I that the original channel by means of which the white farmer became acquainted with corn was the American Indian. There is evidence in early writings (399, 553) that sweet corn as such was not the most common among corn types used by the Indians; and that dent, flint, and flour types were used in greater quantity by them as a source of food. It was natural, therefore, that when corn was first used by the white man that certain of these early Indian corns were commonly grown and used in the manner most preferred by the whites, i.e., as boiling or as roasting ears.

For many years these corn varieties really made up the majority of the acreage planted to "sweet corn," but as new varieties with wrinkled seed were developed the dent, flint, and flour varieties were planted less and less. Today they are seldom planted on farms or in the gardens in New York State. Adams Early, the most popular of these sorts, represented not only a single variety, but also came to designate the whole group of corn varieties (Adams group) listed by seed companies in the North as garden field varieties and by seed companies in the South as garden corn (not sugar), sweet corns, or corn for roasting.

No attempt has been made to describe all varieties which are listed as dent, flint, or flour corns and which are grown for either boiling or roasting ears. These varieties for the most part are found listed in catalogs coming from the South. The most important of these varieties or at least one variety to represent each of the various types has been described. It is to be noted that since these varieties are those most prominently listed in the Southern catalogs, they are probably the ones best suited for that section, growing vigorously, producing a large number of ears per acre, and showing considerable resistance to the corn ear worm.

WHITE-KERNELED VARIETIES

Adams Early. Refs. 14, 22, 40, 73, 74, 87, 89, 90, 91, 93, 95, 96, 120, 126, 200, 214, 238, 240, 241, 272, 335, 345, 354, 361, 367, 397, 404, 405, 406, 411, 451, 465, 468, 503, 511, 514, 525, 546, 569. Syns. Adams, Adams Early Improved, Adams Early White, Adams XX Early, Extra Early Adams White, Ideal, Ideal Early, Ideal Early Adams, Ideal Extra Early, New Ideal. Illus. 25, 90.

Adams Early is described in the paper by Salisbury, 1848, as a variety obtained from a Mr. Walker of the

District of Columbia. From the very beginning of its period of usefulness there has been two undisputed characteristics which continued this variety in use in all parts of the country. These can be summed up in the phrase "its merits are earliness and productiveness." Of all the names used for Adams corn, there are four which have generally existed and which have continued in use, each representing a slightly different selection and differing in vigor, size of ear and plant, and in time of maturity. Adams Early, Extra Early Adams (syns. Burlington, Early Burlington), Extra Early Dwarf, Adams, and Large Adams are the four names. Of these, the first two were the earliest in use while the latter two are of more recent origin and are those most commonly found today. Burr wrote, "Adams Early White: In its general appearance, the ear is not unlike some descriptions of Southern or Western field corn. In quality it cannot be considered equal to some of the shrivelled-kerneled, sweet descriptions, but will prove acceptable to those to whom the peculiar sugary character of these may be objectionable."

Edible ears of Adams Early were obtained at Geneva in 82 days, 5 days later than Extra Early Dwarf Adams, 12 days later than Extra Early Adams, and 8 days earlier than Large Adams. Although the kernels of these varieties are much the same, certain plant characters serve to distinguish them. In plant height Adams Early is intermediate to Extra Early Dwarf Adams and Extra Early Adams. The tassels of Adams Early are much longer, are more delicate, and contain more laterals than Extra Early Adams. The ears are $1\frac{1}{2}$ to 2 inches longer and usually have two less rows, although this is not always consistent. Extra Early Dwarf Adams, the smallest in the group, has tassels which are short, very coarse and possess few, short, stiff laterals and in this respect is most like Extra Early Adams.

Although these varieties are not true sweet corns, they possess fair quality when harvested at the correct stage of maturity. The hardness of the seeds enable them to germinate under more adverse soil moisture conditions, while the extreme tightness of the wrapped husks at the apex of the ear limit the ear worm damage to a minimum. These factors have made this variety particularly adaptable to southern growers, who find it difficult and usually impossible to grow the true sweet corn successfully.

Plant medium tall, $5\frac{1}{2}$ -6 feet; stalks moderately heavy and straight; nodes 10-12, covered, not prominent; brace roots present, whorl complete on one and occasionally two nodes, useful. Tillers entirely absent. Leaves medium long and moderately narrow,

28-30 x 3-3½ inches; sheath longer than internode. Tassel moderately long and heavy, 18-20 inches; terminal spike erect; lateral spikelets nearly erect, medium in number, medium long, stiff and moderately crowded; bracts green, very slightly striped with pale red, occasionally ringed at the base; anthers usually buff (chamois); 60-62 days to anthesis.

Ears borne at 4th to the 6th nodes, one and occasionally two ears per stalk, very often several auxiliary ears attached to the same node. Shank short and heavy, 2-4 inches. Husk leaves rudimentary or entirely lacking. Husks many, thin, exceedingly well and tightly wrapped about the ear, difficult to remove, kernels often bearing husk impressions due to tight wrapping. Husked ear moderately short and plump, 6-7 x 2-2¼ inches, distinctly and quite uniformly tapering; base compressed; tip abruptly conical to rounded; rows 12-14, regular, straight at the base but usually somewhat spiral at the tip, occasionally lost at the apex, exceedingly crowded both around the cob and in the rows.

Kernels at milk stage white, large, moderately wide, shallow and rather thick; at dry stage, crown starchy white, remainder flinty, broader than long, 1.07 x 1.13 x .42 cm. (88 seeds per oz.); short rectangular, almost square in shape; crown rounded; surface smooth, crease-dented; set very tightly on cob.

The following varieties are similar in type to Adams Early, and may be discussed under this variety. The remarks concerning each are largely based on observations at Geneva. Blands Extra Early (345, 522) possessed typical Adams Early ears, but produced them on much more slender stalks. Baltimore or Extra Early Baltimore (227, 403, 518) was practically identical to Adams Early. Early Morn (521) likewise was so nearly like Adams Early as to present no practical separation. Delicious Cream (519) was reported to have resulted from a cross involving Adams Early and a sweet corn. No direct comparison has been made in our trials. Sixty-five Day White Cob (46) also proved to be practically identical to Adams Early, maturing at the same time, and producing plants and ears of similar character. Bol Early (48) is the most divergent of the group, being a slightly less vigorous grower and producing a more bushy and branching tassel and kernels which, in the dry state, are definitely thicker and much less inclined to dent.

Burlington Hybrid. Refs. 91, 125, 207, 208, 227, 275, 290, 312, 313, 328, 403, 512. Syns. Early Burlington Hybrid, Landreth Early Market.

Burlington Hybrid was one of the most highly publicized varieties of the entire non-sweet group. It originated in Burlington County, New Jersey, as the result of a cross involving Extra Early Adams and Early Mammoth. Although grown and apparently safeguarded by a few market gardeners for a few years near its place of origin, it was finally introduced to the general public by Johnson and Stokes in the spring of 1889.

At Geneva 88 days were required to reach edible maturity. This was 6 days later than Adams Early and 2 days earlier than Large Adams. The plants of Burlington Hybrid are the same height as those of Adams Early, but more slender, more leafy, and have longer tassels. The husked ears are slightly longer and decidedly more slender, while the kernels are slightly larger with a smooth, flinty surface.

Plant medium tall, 5-5½ feet; stalks slender and straight; nodes 9-10, covered, not prominent. Brace roots usually present,

rather heavy and useful. Tillers absent. Leaves moderately short and medium narrow, 26-28 x 3½-4½ inches; sheath longer than internode. Tassel moderately short and slender, 15-16 inches; terminal spike erect; lateral spikelets nearly erect, medium in number and length, rather crowded; bracts green, slightly striped with red; anthers yellow (pinard yellow); 63-65 days to anthesis.

Ears borne at the 3rd and 4th nodes, one and occasionally two ears per stalk. Husks many, rather heavy and tightly wrapped. Husk leaves few, short, and light. Husked ear medium long and moderately slender, 7-8 x 1½-1⅝ inches; slightly tapering; tip abruptly conical; rows 10-12, regular, crowded around cob.

Kernels at milk stage white; medium width and thin; at dry stage dull amber white, broader than long, .89 x 1.07 x .39 cm. (108 seeds per oz.); short oval; crown rounded; surface smooth; set on cob tightly.

Although not grown at Geneva, reports indicate that in general appearance Buck Mountain or Burlington Market (238, 293, 373, 403, 406) was much like Burlington Hybrid. Fifty Day (521) was in type much like Burlington Hybrid, but produced a longer ear somewhat earlier in season.

Extra Early Beverly. Refs. 313, 405, 515. Syns. Beverly, Earliest Table, Early Beverly, First Early Table.

Extra Early Beverly was a half-sugar variety introduced about 1898 by D. Landreth and Sons, Philadelphia. The reports from early trials of this variety were very favorable. Rane (405) calls it "the only extra early 10 to 12 rowed variety of good quality." Taft (595) in 1899 noted its "delicious flavor." Landreth continues to list the variety and they have maintained the stock as "a flinty grained variety which can be planted early in cold, wet ground."

Seventy-eight days were required to produce ears of edible maturity at Geneva, which was 4 days earlier than Adams Early.

Plant medium tall, 5-5½ feet; stalks moderately slender and slightly zigzag; tillers very few to none. Tassel medium long, 16-18 inches, lateral spikelets moderately many, drooping, simple and rather crowded. Ears borne at 3rd and 4th nodes, one and occasionally two ears per stalk. Husked ears medium long and moderately slender, 7-8 x 1½-1⅝ inches, partly cylindrical, slightly tapering; rows 12, regular, some inclined to be noticeably paired. Kernels at milk stage white, narrow, rather shallow and plump; at dry stage pale amber white, small, wider than long; surface smooth-flint type; set tightly on white cob.

First Early Neck (40, 241) was a smaller grower, but produced ears very much like Beverly.

French Market. Ref. 494. Syn. Improved French Market.

Information concerning the origin and introduction of this variety has not been found. The earliest catalog reference available indicates that it was featured by J. Steckler Seed Company of New Orleans, Louisiana, as early as 1910. It is used as a home and truck garden variety in the vicinity of New Orleans.

Ninety-two days were required for this variety to produce edible ears at Geneva. This was 2 days later than Large Adams, 10 days later than White Australian, and 6 days earlier than Stowell's Evergreen. The plants are 2 to 2½ feet taller than those of Large Adams, have longer and broader leaves, and a tassel that has



ADAMS EARLY

(Natural size)



WHITE AUSTRALIAN

(Two-thirds natural size)

more laterals which are decidedly more crowded. The ears are borne higher, on longer more pendant shanks than those of Large Adams. The husked ears are longer, more plump, and much less tapering with 2 to 4 more rows. The kernels in the dry stage are considerably longer in proportion to the width than those of Large Adams and are borne on a red instead of a white cob. It is one of the lesser grown sorts of the class, but when harvested at the correct stage becomes a fair substitute for the true sweet corn.

Plant very tall, 9-10 feet; stalks heavy and straight; nodes 15-16; covered, not prominent. Brace roots present, heavy, whorl complete on 2 nodes, useful on one. Tillers absent. Leaves long and moderately broad, 35-36 x 4-5 inches; sheath longer than internode. Tassel moderately long, 18-20 inches; terminal spike erect; lateral spikelets horizontal, many present, long, and very crowded; bracts green, moderately striped with red; anthers buff (deep colonial buff to chamois); 74-76 days to anthesis.

Ears borne at 8th and 9th nodes, one and occasionally two ears per stalk; shank variable, weak, extending well away from stalk. Husk leaves very few to none, distinctly short and light. Husks many, thick, short, tightly wrapped and difficult to remove. Silk abundant, long and red. Husked ear long and plump, 9-10 x 2-2½ inches, partly cylindrical and slightly tapering; rows 16-20, regular, straight, crowded around the cob.

Kernels at milk stage white, medium width and depth, thin; at dry stage starchy white, particularly the crown, much longer than wide, 1.3 x .87 x .37 cm. (88 seeds per oz.); nearly triangular; crown straight; surface crease-dented, and very slightly rough at the point of stylar attachment; set tightly on red cob.

Hickory King. Ref. 89. Illus. 25.

Ears of Hickory King reached edible maturity in 110 days and represent the largest seeded white dent variety grown at Geneva. It is grown to some extent in the southern states as a source of roasting ears.

Plant tall, 7½-8 feet; stalks heavy and straight; 14-16 nodes, covered, close together; tillers absent. Brace roots present and complete on 2 nodes. Leaves long and broad, tassel moderately long; lateral spikelets many, rather long, horizontal. Ears borne at 8th and 9th nodes, one ear per plant. Husked ears medium long and moderately slender, 7-8 x 1½-1⅞ inches; kernels very wide, thin and deep; dent surface, set tightly on small white cob.

Large Adams. Refs. 7, 254, 403, 517. Syns. Adams Dreadnaught, Early Large Adams, Large Early White Adams, Second Early Adams, Dreadnaught Ideal.

To meet the requirements of a greater spread in season of edible maturity, larger strains of the Early Adams were developed. The specific time or place concerning the introduction of the first selection (larger and later) from Adams Early is unknown. Large Adams has plant and ear characters which differ noticeably from those of Adams Early and the two stocks are therefore described separately.

Ninety days were required for ears to reach edible maturity at Geneva. This was 4 days earlier than Truckers Favorite, 8 days later than Adams Early, and 8 days earlier than Stowell's Evergreen. The plants are 2 to 2½ feet taller than Adams Early and heavier. The ears and shanks are much longer, the latter often being pendant. The kernels have converging crowns, whereas those of Adams Early are rounded

and in the dry stage are considerably longer in proportion to the width.

As with Adams Early, this variety is used extensively by southern growers instead of the true sweet corn varieties. Its large and practically ear worm impervious, tightly wrapped ears render it useful to those areas that ship to the early northern markets.

Plant tall, 7-8 feet; stalks straight and moderately heavy; nodes 12-14, covered to very slightly exposed, not prominent. Brace roots occasionally present, rather heavy, whorl not complete, not very useful. Tillers entirely absent. Leaves moderately long and medium width, 32-34 x 3½-4½ inches; sheath equal to and often longer than internode. Tassel medium long, 16-18 inches, rather coarse and heavy; terminal spike erect; lateral spikelets nearly erect, medium long, simple, medium in number, not very crowded; bracts and anthers variable in color; 66-68 days to anthesis.

Ears borne at 6th and 7th nodes, often two ears per stalk, one usually a nubbin. Shank long and heavy, 6-8 inches, often distinctly pendant. Husk leaves few, very short and light. Husks many, short, coarse and heavy, tightly wrapped and difficult to remove. Husked ear moderately long and moderately plump, 8-9 x 1⅞-2 inches, decidedly tapering; base enlarged and compressed; tip conical and slightly exposed; rows 16-18, straight, occasionally lost near apex, crowded around the cob.

Kernels at milk stage white, narrow, deep and thick, crown somewhat converging, with point of stylar attachment extended and prominent; at dry stage starchy white at the crown, the remainder flinty, considerably longer than wide, medium thickness, 1.13 x .94 x .42 cm. (88 seeds per oz.); rectangular; crown nearly straight; surface crease-dented, otherwise smooth; set tightly on cob.

In this group the varieties Paducah Market (572) and Gentry Early Market (515, 561) may be included. The former is 1½ to 2 feet taller than Large Adams and possesses a more bushy tassel. The ears are of equal length but have 4 to 6 less rows of kernels. Gentry Early Market was a large-eared sort of the Adams type coming after Early Adams. It was featured by T. W. Woods and Sons of Richmond, Virginia.

Mexican June. Refs. 221, 453.

The earliest date of introduction that has been found indicates that J. J. H. Gregory listed Mexican June as one of his novelties in 1896. Although no information is given concerning its origin, Chris Reuter, a seedsman of New Orleans, Louisiana, mentioned in 1913 "The genuine Mexican June corn is only grown in one part of Mexico." Its use as green corn is confined to the southern states, particularly Texas and Louisiana. It has also been used by Dr. P. C. Mangelsdorf of the Texas Experiment Station in developing a vigorous ear worm-resistant sweet corn variety. His efforts culminated in the production of Honey June, a variety which resulted from a cross between Mexican June and Country Gentleman.

Edible ears of Mexican June were produced at Geneva in 104 days, 2 weeks later than Large Adams and 10 days later than Truckers Favorite. The plants are equal in height to those of Truckers Favorite and slightly more slender and straighter, while the anthers are definitely buff instead of reddish bronze. The husked ears are about equal in length but are slightly more plump, likewise the kernels in the dry stage are much thinner, more rounded, and more nearly smooth.

Plant tall, $7\frac{1}{2}$ – $8\frac{1}{2}$ feet; stalks medium heavy and straight; nodes 14–16, nearly covered, not very prominent. Brace roots present, heavy, whorl complete and useful on two nodes. Tillers absent. Leaves long and broad, 38–40 x 5–6 inches; sheath equal to internode and occasionally longer. Tassels moderately long and heavy, 18–20 inches; terminal spike slightly drooping; lateral spikelets nearly horizontal, many present, moderately long and very crowded; bracts pale green, slightly striped with red; anthers buff (deep colonial buff to chamois); 88–90 days to anthesis.

Ears borne at 9th to 11th nodes, often two ears per stalk, with an occasional nubbin present. Husks many, thick and very tightly wrapped. Husked ears moderately long and plump, 8–9 x $2\frac{1}{4}$ inches; moderately tapering; base compressed, tip conical and nearly capped; rows 12–16, straight, very crowded around the cob and in the row.

Kernels at milk stage white, medium width and deep; at dry stage pale creamy white, longer than wide, distinctly thin, 1.15 x .98 x .29 cm. (132 seeds per oz.); nearly rectangular; crown rounded, nearly semicircular; surface very slightly dented, often nearly smooth; set very tight on cob.

Norfolk Market. Refs. 403, 521, 533.

This was introduced by George Tait and Sons of Norfolk, Virginia, in 1897 and has been continued by that company to the present time. It was advanced as superior to Adams Early and purported to be a valuable addition to the group. At Geneva 99 days were required for the ears of Norfolk Market to reach edible maturity. This was 5 days later than Truckers Favorite and 5 days earlier than Mexican June.

Plant tall, 8– $8\frac{1}{2}$ feet; stalks straight and moderately heavy. Tillers absent. Brace roots rather heavy, whorl complete and useful on one node. Leaves long and broad; sheath longer than internode. Ears borne at 7th and 8th nodes; shanks very long and heavy; husked ears moderately long and medium plump, 8–9 x $1\frac{3}{4}$ – $1\frac{7}{8}$ inches, nearly cylindrical; rows 14–18, regular, well filled at the tip. Kernels in milk stage snow white, thin, medium width; at dry stage pale amber white, small, nearly round; crown semicircular; surface dented; set tightly on white cob.

Sioux Squaw. Ref. 212. Illus. 25.

This variety may be used to represent a type of Indian corn which was very common among many Indian tribes. The diversity of dry kernel colors present on any one ear was apparently an attractive feature of this sort. In later years Oscar H. Will was instrumental in making various selections from the native squaw corn and thereby developed greater uniformity of color.

Sioux Squaw produced edible ears in 76 days at Geneva, 6 days earlier than Early Adams, about the same season as Alpha, and 10 days later than Assiniboine. The plants were much the same as those of Assiniboine, although the ears were slightly shorter and decidedly less uniform in color. The various kernel colors in the dry stage suggest the novelty, and it is used occasionally by private gardeners for that purpose.

Plant moderately short, 4– $4\frac{1}{2}$ feet, stalks straight and slender. Tillers few, much shorter than central stalk. Tassel short and moderately slender, 12–15 inches, variable in bract and anther colors. Ears moderately long and medium plump, 7–8 x $1\frac{1}{2}$ – $1\frac{7}{8}$ inches, slightly tapering; rows 10–12, slightly curved. Kernels at milk stage white, medium size, rather shallow; at dry stage, variously colored, white, blue, pink, red, etc., broader than long, crown rounded, surface smooth; set tightly on cob.

Truckers Favorite. Refs. 21, 403, 516, 533.

Introduced by T. W. Wood and Sons of Richmond, Virginia, about 1899, this variety has proved to be one

of the most popular of its kind. No information concerning its origin by the introducer is available although the George Tait and Sons Seed Company suggests that it developed as a selection from Early White Dent.

Truckers Favorite produced edible ears in 94 days, 4 days later than Large Adams and 4 days earlier than Stowell's Evergreen. The plants are slightly taller than those of Large Adams and have more prominent brace roots and heavier tassels with more laterals. The ear shanks are shorter and more slender, while the husked ears are slightly longer, more cylindrical, and much more rounded at the tip. The kernels in the dry stage are slightly longer in proportion to the width and have a rough instead of a smooth crown surface. The variety is used widely in the southern states where it is grown in the place of true sweet corn.

Plant tall, 8– $8\frac{1}{2}$ feet; stalks slightly zigzag and heavy; nodes 13–15, covered, not prominent. Brace roots present, heavy, useful and whorl complete on 1st and 2nd nodes. Tillers absent. Leaves moderately long and medium broad, 32–34 x $3\frac{1}{2}$ – $4\frac{1}{2}$ inches; sheath longer than internode. Tassel moderately long and heavy, 18–20 inches; terminal spike erect; lateral spikelets horizontal, long, many present, crowded and multi-branched at the base; bracts green, sparsely striped with pale red and usually ringed with red at the base; anthers light reddish bronze (terra cotta); 72–74 days to anthesis.

Ears borne at 7th and 8th nodes, one and two ears per stalk. Shank short and slender, 2–3 inches occasionally much longer, resulting in pendant ears. Husk leaves few to none, very short and light when present. Husks many, short, heavy, very tightly wrapped and difficult to remove. Husked ear long and moderately plump, 8–10 x $1\frac{7}{8}$ –2 inches, partly cylindrical and slightly tapering; base enlarged but compressed; tip rounded and capped; rows 14–18, very crowded around the cob.

Kernels at milk stage white, large and deep; at dry stage starchy white at crown with the remainder rather flinty, much longer than broad, 1.25 x .86 x .4 cm. (88 seeds per oz.); nearly rectangular in shape; crown slightly rounded; surface crease-dented and jagged, often beaked; set very tightly on cob.

Silver King (522) is a white dent corn that can be used for early "roasting ears" or as an early field crop. At Geneva it was similar to Truckers Favorite.

Tuscarora. Refs. 87, 423, 507. Syns. Early Tuscarora, Large Tuscarora, Turkey Wheat.

Concerning this flour corn variety, Sturtevant wrote in the New York Agricultural Experiment Station Report for 1884, "This variety was brought to New York by the Tuscarora Indians in 1712, when they emigrated from North Carolina, and it is supposed to be the variety under Indian culture at the time of the settlement." It was also recorded by Bonafous as growing on the banks of the Missouri River and was given the name *Zea erythrolepis*.

Early reports indicate that Tuscarora was well liked by the Indians and later by the white man. Burr states "When ground in the ripe state, it was much less farinaceous and valuable for cooking or feeding stock than the fine, white, floury appearance of the kernel when cut or broken, would seem to indicate." It was listed at least as early as 1838 by Breck and Thorburn.

Plant tall, 6–7 feet; moderately strong and vigorous. Ears borne 18–24 inches from the ground, 8–10 inches long, $1\frac{3}{4}$ –2 inches in diameter at the base, tapering; 8-rowed, usually distinctly fur-

rowed at the base. Kernels in the green state were of fair quality and considered a valuable sort by those to whom the sweetness of the sugar varieties is objectionable. The dry kernels very large, creamy white, frequently creased at the crown and borne on a red cob.

Tuxpan. Ref. 307.

Tuxpan is reputed to be a selected strain of a Mexican variety and was featured for the first time by the Kilgore Seed Company of Plant City, Florida, in 1931. This was the tallest, most vigorous grower of any maize grown at Geneva. Necessarily it did not produce edible ears until the last of the season, 124 days being required to attain the proper stage of development. The plants were very tall, 9 to 10 feet; very heavy, often $2\frac{1}{2}$ inches in diameter; and entirely devoid of tillers. The tassel was about 20 inches long, very bushy, and had anthers rather uniform yellow in color (pinard yellow to warm buff). The ears were borne at the 14th and 15th nodes, were 8 to 9 inches long, medium plump, and contained 14 rows. Kernels in the milk stage were snow white, with a diverging crown. In the dry stage, they were starchy white, thin, and dented.

White Australian. Ref. 88. Illus. 25, 91.

White Australian has been used as roasting corn in the mountain states where the nights are too cool for the best growth of sweet corn. No record of its history is available, but it was offered by D. V. Burrell of Rocky Ford, Colorado, at least as early as 1909.

Eighty-two days were necessary for edible ears to be produced at Geneva. This was in season with Adams Early, 6 days earlier than White Cory, and 2 days later than Whipple's Early. The plants are 1 to $1\frac{1}{2}$ feet taller than those of Adams Early, more slender and zigzag, inclined to tiller, and the nodes are less completely covered by the sheath. The ears are borne slightly lower on longer shanks, while the husked ears are 3 inches longer, decidedly more slender, and have fewer rows. The kernels in the dry stage are flinty instead of dent.

Plant tall, 7 feet; stalk slightly zigzag and moderately slender; nodes 8-9, nearly covered, not very prominent. Brace roots present and complete on one and occasionally two nodes, useful. Tillers few. Leaves medium long and moderately narrow, 28-30 inches \times $3-3\frac{1}{2}$ inches; sheath equal to internode. Tassel moderately long, 18-20 inches; terminal spike nearly erect; lateral spikelets slightly drooping, many, medium long and crowded; bracts green striped with darker green; anthers buff (chamois); 64-66 days to anthesis.

Ears borne at 3rd to 5th nodes, usually two ears per stalk. Shank long and heavy, 5-6 inches. Husk leaves few, short and light. Husks many, heavy, medium long, rather tightly wrapped and difficult to remove. Husked ear long and moderately slender, 9-10 \times $1\frac{1}{2}-1\frac{5}{8}$ inches, nearly cylindrical; base compressed; tip conical and slightly exposed; rows 8-10, straight, regular, not crowded around the cob.

Kernels at milk stage chalky white, medium width, thin and shallow; at dry stage flinty amber white, wider than long, .98 \times 1.1 \times .52 cm. (88 seeds per oz.); oval; crown distinctly rounded, nearly semi-circular; surface hard and smooth; set tightly on cob.

Pennsylvania Rare Ripe (515) is a long white flint much like White Australian and is used chiefly as a hominy corn. The grains are large, pure white, and are borne on long 8- to 10-rowed ears.

Early Jefferson or Jefferson (87) was also similar in type to present-day White Australian. The plants and ears were slightly shorter, while the latter were reported to have had a delicate shade of rose-pink near the tip. This character (pink tip) often appears in several of the white dent varieties, although not consistent in the same variety from year to year.

YELLOW-KERNELED VARIETIES

Alaska Indian. Refs. 126, 180, 411. Syns. Alaska Early, New Alaska.

This is possibly one of the earliest of all corn varieties. It is not a sweet corn but was offered in 1925 by the Henry Field Seed Co., Shenandoah, Iowa, as a variety that could be grown in the far north and in high altitudes. The plant grows to a height of from 2 to 3 feet. The ears are small and bright yellow. It is of chief value to the plant breeder.

In general appearance, this variety is very much like Assiniboine. Edible maturity was reached at Geneva in 66 days, which corresponded exactly with the Assiniboine. The plants, however, average 1 foot shorter and the ears 3 to 4 inches shorter. The kernels are identical in shape, size, and color. Alaska Indian, although of equal quality to Assiniboine, has been largely replaced by the latter in the Northern Plains area chiefly because of its greater vigor and larger ear.

Assiniboine Yellow. Refs. 242, 335, 557. Syn. Assiniboine. Illus. 25.

Pictures and illustrations of Indian women preparing corn generally show ears of many colors, white, red, yellow, pink, blue, black, or even ears with mixed colors. George Will, whose admirable study, *Corn Among the Indians of the Upper Missouri*, presents a wonderful picture of the Indian tribes inhabiting the Upper Missouri, the Northern Plains, and the Lakes' area, obtained and improved some of the native corn varieties.

Among other strains which Mr. Will discovered was an early flour corn obtained from the Assiniboine Reservation in Saskatchewan about 1916. It was known to have been grown there for over 40 years, and therefore had become acclimated to that region of short season and scanty rainfall. After several years of selection, a pure yellow stock was introduced in 1920 by Oscar H. Will & Co. as Assiniboine Yellow. It was then considered the earliest of the Indian Squaw corns and nearly equal to sweet corn in flavor.

Edible maturity was reached at Geneva in 66 days, which proved to be about in season with Alaska Indian and 12 days earlier than Golden Bantam. Although it does not equal the true sweet corns in quality, its earliness, vigor, and more or less resistance to adverse weather conditions have rendered it useful in the Northern Plains area as a source of green corn. It most resembles Alaska Indian, producing somewhat taller plants and much longer ears. In all other respects the two varieties are very similar.

Plant moderately short $4\frac{1}{2}$ to 5 feet; stalk slender and straight; nodes 6-7, slightly exposed, moderately prominent. Tillers few,

much shorter than central stalk. Leaves medium long and moderately narrow, 28-30 x 3-3½ inches, often red on the margin; sheath shorter than and occasionally equal to internode. Tassel short and slender, 12-15 inches; terminal spike erect; lateral spikelets nearly erect, few, medium long and crowded; bracts and anthers variable in color; 43-45 days to anthesis.

Ears borne at 2nd and 3rd nodes, one and occasionally two ears per stalk. Shank long, 3-8 inches, slender and brittle. Husk leaves usually very long and heavy; husks moderately many, heavy, and rather tightly wrapped. Husked ear long and slender, 8-10, x 1½-1⅝ inches, slightly tapering; tip conical and slightly exposed, very often nearly capped; rows 8-10, moderately straight, occasionally spiral, crowded around the cob.

Kernels at milk stage yellow, broad and shallow; at dry stage bright yellow, small, much broader than long, .8 x 1.05 x .42 cm. (108 seeds per oz.); short, broad, oval in shape; crown very definitely and uniformly rounded; surface smooth, entirely devoid of wrinkling; set very tightly and firmly on cob.

Early Canada. Refs. 87, 468. Syns. Canada Yellow, Canadian Yellow Flint, Early Eight Rowed Canada.

This variety was mentioned by Salisbury in 1848 among others similar in type as an earlier and much smaller variety than either the Large 8-rowed Yellow Flint or the Middle Sized 8-rowed Yellow Flint. It was of this variety that Salisbury speaks when he wrote concerning the sweet varieties then in existence "There are several sub-varieties —, and a new variety made by crossing the sweet with the Early Canada." This sug-

gests the possibility that the hybrid mentioned might have been the precursor of the small-eared yellow sweet varieties now represented by Golden Bantam.

The following description is compiled from the earlier authors, chief of whom were Salisbury and Burr.

Plant 4-5 feet tall, stalks slender; leaves rather scanty. The ears were small, 7 inches, uniform, tapering, eight-rowed with prominent furrows between pairs of rows; kernels nearly semi-circular at the crown; smooth, flinty surface, glossy orange-yellow in color; cob small, white.

Norwegian (17) was also much like Early Canada but larger eared.

Manhattan. Refs. 74, 271, 343, 450, 454, 503, 515, 528.

From 1895 to 1902, J. M. Thorburn & Co. listed this as Thorburn's Manhattan Sweet Corn. It was credited as being the earliest sweet corn grown ready for the table in 6 weeks from the time of planting. The dry kernels were not wrinkled and therefore the variety was not a true sweet corn. It originated in the extreme north as a yellow type, although occasionally the ears showed both yellow and white kernels. We suspect that Manhattan was another of the early Indian corns similar to Alaska Indian and Canada Yellow. When first introduced it was listed with the new, rare, and valuable vegetable seeds.

SUPPLEMENTARY LIST OF OBSCURE VARIETIES

The names given below represent varieties which can be considered of minor importance and about which little information is available; varieties which were in existence for a very short period; or varieties the seed of which is not available today and therefore no plantings could be made to secure descriptions or

determine their status with reference to recognized standard sorts. These variety names are included in the classified index under the appropriate section; viz., white-kerneled sweet corn, yellow-kerneled sweet corn and other forms of maize used as sweet corn. No name is listed unless a definite reference can also be cited.

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| <p>Alexander Sugar. Refs. 367, 368. Syn. Early Alexander. Allens Choice. Ref. 348. Amazement. Ref. 533. American Gold. Conn. Supl. to Cir. 94. Bates Extra Early. Refs. 14, 17. Blood Red Sweet. Ref. 421. Bloomsdale Sugar. Refs. 315, 533. Bunks Best. Ref. 487. Brainard Sugar. Ref. 311. Breaky, J. Ref. 560. Bryant. Ref. 238. Syn. Early Bryant. Ref. 289. Cambridge Sweet. Ref. 535. Campbell's Extra Early. Ref. 454. Constantinople. Ref. 10. Cooper's Large Shoe Peg. Ref. 370. Country Queen. Ref. 335. Crawford. Ref. 22. Cross. Ref. 405. Dessert. Ref. 533. Dreer's Best. Ref. 538. Dugan's Sweet. Ref. 404. Earliest on Earth. Ref. 326. Early. Ref. 335. Early Butler. Ref. 450. Early Cape May. Ref. 371. Syn. Havenstein's Early Cape May. Early Chance. Ref. 29. Early Dobson's Evergreen. Ref. 518. Early Eight Weeks. Ref. 533. Early Express. Refs. 386, 484. Syn. Extra Early Express. Early Gen. Refs. 144, 537. Early Giant Wonder. Ref. 360. Early Golden Majoram. Vaughan Cat. 1933. Early Golden Sweet. Vaughan Cat. 1933. Early Goose. Ref. 321. Syn. Extra Early Goose. Early Honey Cream. Ref. 301. Early Irondequoit. Refs. 249, 348. Early Longfellow. Refs. 403, 406. Syn. Longfellow Sugar. Early Marvel. Ref. 102.</p> | <p>Early Monarch. Refs. 148, 149, 533. Syns. 80-Day Monarch, Ohio Monarch. Early Norfolk. Ref. 403. Early Page. Refs. 345, 564. Syn. Extra Early Page. Early Reliance. Ref. 135. Syn. First Crop Reliance. Early Sensational. Ref. 37. Early Windsor. Refs. 238, 241, 406. Early XXX. Ref. 335. Early Yankee. Ref. 385. Eastwick. Ref. 361. Eclipse. Refs. 121, 401, 533. Syn. New Eclipse. Electric. Ref. 368. Eruda. Ref. 89. Eureka. Ref. 22. Syn. Eureka Early. Extra Early. Refs. 13, 552. Extra Early Dreer's. Ref. 91. Syn. Dreer's. Extra Early Independence. Ref. 142. Extra Early Purity. Ref. 298. Extra Extra Early. Ref. 298. Farquhar Early. Ref. 22. First and Best. Refs. 22, 128. First Early. Ref. 241, 370. First in Market. Refs. 200, 238, 239. Syn. Imitation. French Honey. Refs. 370, 533. Syn. New French Honey. Garwood. Ref. 238. General Grant. Ref. 216. Giddings. Ref. 22. Golden Margem. Conn. Supl. to Cir. 94. Hammonds Best. Ref. 238. Harmon. Ref. 533. Harris' Extra Early. Refs. 238, 246, 406. Hartner's Early Pearl. Ref. 550. Syn. Extra Early Pearl. Harvey's Early. Ref. 252. Heath's Early. Ref. 374. Hendersons Sugar. Refs. 61, 125, 207. Hickman's Extra Early Three-Ear. Ref. 373. Hickox Hybrid. Ref. 508. Honey June. Count. Gent. Nov. 1933. 14. Horsfords Little Giant. Ref. 439.</p> |
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| <p>Hyde's Earliest Sugar. Ref. 371. Indiana Wonder. Refs. 156, 515, 533. Jack Frost. Ref. 320. Syn. Early Sweet Jack Frost. June Market. Ref. 533. Kendel's Early Market. Ref. 405. Keystone Wonder. Ref. 533. King of the Earlies. Refs. 22, 367, 441. Kloochman. Ref. 335. Krein-Bring. Ref. 151. Landreth Early. Ref. 537. Landreth Hybrid. Ref. 314. Large Connecticut. Ref. 271. Late Red Cob. Ref. 17. London Market. Ref. 22. Macomber. Ref. 368. Mammoth White Surprise. Ref. 397. Manchester. Ref. 94. Manitowoc. Ref. 349. Syn. Extra Early Manitowoc. Maple Sugar. Ref. 35. Syn. Early Maple Sugar. Mohawk Valley Extra Early. Ref. 369. Musser. Ref. 238. New Corn No. 7. Refs. 516, 517. New Early Daybreak. Refs. 184, 401. Syns. Early Daybreak, Daybreak. New England Orange. Ref. 90. New Rose. Ref. 501. New York Family. Ref. 383. North Star. Ref. 533. Northern Success. Refs. 335, 533. Northrup King & Co. XXXX. Refs. 240, 241, 515, 533. Noxal. Ref. 241. Oakview Market. Refs. 174, 238, 241. Orange County Cream. Ref. 22. Peachblow. Ref. 370. Syn. New Peachblow. Pearl of Waterloo. Ann. of Hort. 1892. 171. Perfection 2nd Early. Ref. 485. Philadelphia Favorite. Ref. 363. Phillip's New Wonder. Refs. 241, 391, 394. Syn. New Early Wonder.</p> | <p>Potter's Superb. Ref. 364. Pride of Chenango. Ref. 533. Rennies XXX. Ref. 409. Ringleader. Ref. 518. Robinson's Early. Ref. 155. Ruby Queen. Ref. 22. St. Louis Market. Refs. 396, 533. Sampson's Early. Ref. 516. Schell's Silver Beauty. Ref. 473. Second Early. Ref. 151. Second Early Standard. Ref. 500. Shedaker's Choice. Ref. 479. Simmond's Special. Ref. 335. Simpsonia Prolific. Ref. 368. Syn. Simpsonia. Smith's Early White. Ref. 271. Sonderegger's Earliest. Ref. 489. Southern Express. Ref. 533. Standard Earliest. Ref. 500. Standard Main Crop. Ref. 500. Striped Evergreen. Refs. 238, 282. Syn. New Striped Evergreen. Sugar Kernel. Ref. 362. Sugar Loaf. Refs. 241, 359. Sugar XX. Refs. 207, 208, 352. Sure Cropper Sugar. Count. Gent. Nov. 1933. 14. Sweet Cream. Ref. 389. Table Pedigree. Ref. 503. Telephone. Refs. 240, 405, 412. Syn. Telephone Sweet. The Carolina. Ref. 8. The Don. Refs. 516, 518, 547. Triple Ear. Ref. 110. Troy Market. Refs. 520, 533. Truckers Early. Ref. 403. Tuckit. Ref. 533. Uncle Sam. Ref. 298. Verifirst. Ref. 345. Vermont Pedigree. Ref. 22. Washburn. Refs. 1, 302. White Cob. Refs. 405, 513. Syn. Early White Cob. White Sweet. Ref. 335. White Wonder. Refs. 241, 305. Syn. Kendel's Early White Wonder. Wisconsin Beauty. Ref. 533. Wyoming. Refs. 428, 507, 508. Yexo Sugar. Refs. 253, 533.</p> |
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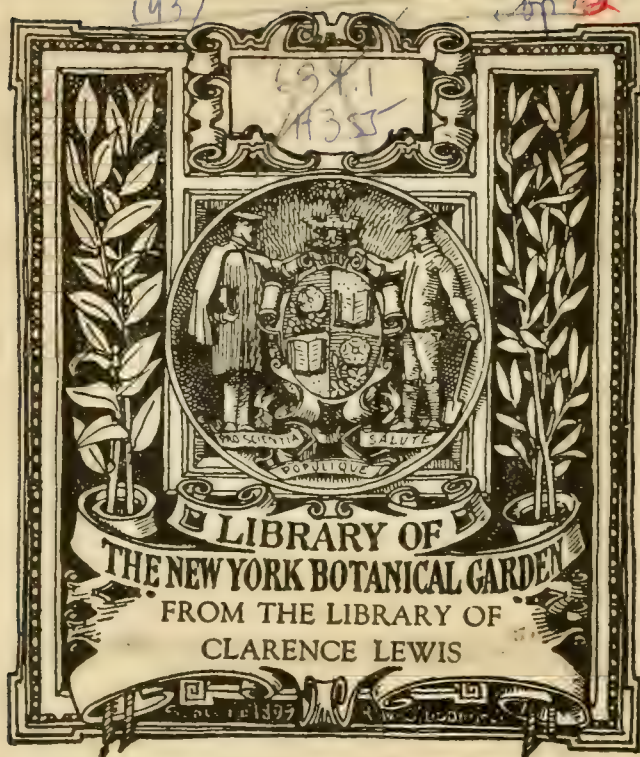
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1
VEGETABLES OF NEW YORK

VOL. 1—PART IV

THE CUCURBITS



STATE OF NEW YORK — EDUCATION DEPARTMENT

THE VEGETABLES OF NEW YORK

BY

WILLIAM T. TAPLEY

WALTER D. ENZIE

GLEN P. VAN ESELTINE

REPORT OF THE
NEW YORK STATE AGRICULTURAL EXPERIMENT STATION
FOR THE YEAR ENDING JUNE 30, 1935



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P R E F A C E

Under authority from the State, Laws of 1925, the New York State Agricultural Experiment Station has published a portion of a work entitled *The Vegetables of New York*. The publication was to be issued in three volumes of several parts each. Part I of Volume 1, *The Peas of New York*, was printed in 1928; Part II, *The Beans of New York*, was printed in 1931; Part III, *The Sweet Corn of New York* was printed in 1934; *The Cucurbits of New York* now appears as Part IV of Volume I.

The Vegetables of New York is intended to be a more or less complete record of the vegetables grown in New York State. In this part the separate chapters give the historical and botanical status of Cucurbitaceae cultivated in the northern states, and full horticultural descriptions of all present-day (and some other) varieties of squashes and pumpkins, muskmelons and cucumbers, with the history of their development.

Since the chief value to seedsmen and to growers of the cultivated cucurbits lies in the discussion of varieties, it is worth noting that the considerations which have governed the selection of varieties for full description and separation into major and minor sorts are as follows: The present value to commercial and home growers of vegetables, the potential merit of new varieties, and the previous importance of historical varieties to the trade. An effort has been made to give the vegetable breeder as complete information as possible on the characters of seeds, plant, and fruit of squashes and pumpkins and of the fruit of muskmelons and cucumbers, to describe varieties which have in the past been leading sorts and which therefore are of value in showing the trend in their development, and to indicate the comparative values between the varieties.

Chapter II on the Systematic Botany of the Cultivated Cucurbits and that part of Chapter I on the early history of these crops were written by Professor G. P. Van Eseltine, Systematic Botanist for the Station. The remainder of the work was written by Professors W. T. Tapley and W. D. Enzie. All illustrations, with the exception of the muskmelons Bender's Surprise, Sugar Rock, and Golden Champlain and of the cucumbers Davis Perfect, Early Fortune, Vaughan, Arlington White Spine, and one depicting several pickle types, were prepared some years ago under the direction of Professor F. H. Hall, co-author of *The Peas of New York*.

The authors wish to acknowledge many helpful suggestions from Professor C. B. Sayre, Chief of the Division of Vegetable Crops at this Station.

U. P. HEDRICK

Director, New York State Agricultural Experiment Station

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THE VEGETABLES OF NEW YORK. I

LEGUMES, CUCURBITS, CORN, ALLIUMS

PART IV: THE CUCURBITS



CHAPTER I

THE HISTORY OF THE CULTIVATED CUCURBITS

The history of the cultivated cucurbits, if written in full, would form a large part of the story of the development of agriculture in the tropics and subtropics of both Old World and New. Of the forms most cultivated in New York State, the squashes¹, pumpkins, etc. (*Cucurbita* spp.) originated in tropical America while the melons and cucumbers (*Cucumis* spp.) as well as the watermelon (*Citrullus vulgaris*) and the gourd² (*Lagenaria siceraria*) came from the tropics of the Old World. Of the other genera briefly mentioned in this volume about half are of New World origin and the remainder are from the warmer parts of the eastern hemisphere.

The place of origin of the annual Cucurbitas was long a moot question. As late as 1855 DeCandolle was dubious as to their source, but in 1882 he had admitted that the *pepos* were of American origin, though he still doubted that *maximas* were from the same region. At that time he gave the weight of evidence as favoring an American origin for a third member of this group, the *moschatas*; and noted in regard to the black-seeded perennial pumpkin or Malabar gourd (*Cucurbita ficifolia*) that he doubted its Asiatic origin "as all the known perennial species of *Cucurbita* are from Mexico or California." All recent evidence, however, points to tropical America as the place of origin of the three important domesticated types as well as the two or three less known species. There are no unquestionable records of annual Cucurbitas in pre-Columbian times except in America. Seeds belonging apparently to nearly all species are known from pre-Columbian graves. The flowers held a sacred place in the religion of some of the Indian tribes, pointing to a great antiquity of culture.³

Results of crossing the three species suggest some type of *moschata* or a very closely allied form as the primitive type of the group, and *moschata* is extremely common and widespread in the American Tropics. According to Vaviloff's theory that the center of distribution of a species is marked by a concentration of

variations of that species, tropical America would thus be designated as the place of origin of the annual types. From this center apparently the *maximas* first developed in the southern part of the region and spread into Peru, Bolivia, and other South American countries. Sometime later it would seem that the *pepos* developed on the northern border and spread north through Mexico and the southern United States. There is evidence that seeds were carried from one region to the other, possibly by trade, and consequently a few members of each type are found in the general distribution region of the others. While such forms of *maxima* as Arikara and Winnebago were introduced into American trade from forms cultivated by plains and prairie Indians, it seems a reasonable explanation, in view of the history of these peoples — the Arikara and related tribes having come originally from the Southwest — that these varieties actually originated in the tropics and found their way northward at a fairly early date. It is likewise extremely probable that the annual species originated from perennial ancestors in southern Mexico or northern Central America.

The culture of some of these squashes and pumpkins is nearly if not quite as old as that of maize; and the presence in eastern Asia of peculiar forms of squashes (and of waxy-endosperm corn) hints of the possibility of transfer to Asia by a returning migration of the aborigines — a circumstance that has been indirectly suggested by the ethnologists interested in the origin of the American Indian. However, the distribution of most of the New World types into the Old World and vice-versa took place in the 16th and 17th centuries. It is rather difficult in many cases to tie up the names used then with the forms now known or the present use of these names. The following names are found in the older literature, and many of the terms are used as indiscriminately as are our present epithets: "pompions" or "pumpions," "pumpkins," "gourds," "melons," "millions," "maycocks," "askutasquash," "quaasien,"

¹ The terms "squash" and "pumpkin" are unfortunately among the few common English names that do not refer to a specific kind of plant. Of the three distinct species of domesticated cucurbits, viz., *Cucurbita maxima*, *C. Pepo*, and *C. moschata*, all have forms to which these names are applied. An attempt, thus far unsuccessful, has been made in America to restrict the use of the term "squash" to varieties of *Cucurbita maxima* and to apply the term "pumpkin" to the other two species. In Australia nearly the opposite recommendation has been made; namely, that "squash" be applied to *C. Pepo* and "pumpkin" to *C. maxima* — the terms "gramma" or "rio" being applied to *C. moschata*. The Australian recommendation is, we believe, the more logical; but, since trade catalogs and horticultural literature in general still apply these names more or less indiscriminately, it has been decided for the purposes of this volume to refer to these three kinds of plants simply as "*maximas*," "*pepos*," and "*moschatas*," leaving the use of the terms "squash" and "pumpkin" as local tradition and common usage may dictate.

² Gourd is likewise used as a general name, the entire family *Cucurbitaceae* being known as the gourd family. In a more specific way the term refers to the hard-shelled types of fruits; and the useful and the so-called ornamental gourds which are so popular at present, are fruits of various species including *Benincasa hispida*, *Cucumis dipsaceus*, *Cucumis Melo*, *Cucurbita Pepo ovifera*, *Lagenaria siceraria*, *Luffa cylindrica*, *Momordica Charantia*, *Trichosanthes Anguina*, and others. It should be noted that the "Calabash gourd" is the fruit of *Lagenaria* while the true Calabash is the fruit of *Crescentia Cujete*, a tree belonging to the same family as the catalpa.

³ Reference should be made here to a recent paper by L. R. Parodi in *Anales de la Academia Nacional de Agronomia y Veterinaria de Buenos Aires*, (1:142. 1935) in which he lists *C. maxima* among the plants cultivated by the natives of northeastern Argentina before the arrival of the Spaniards.

"squash," "ecushaws," "bucklers" or "buckler-gourds," "simnels" and, in French, "melons," "gros melons," "courges," "concombres," and "citronelles." Sturtevant in his Notes⁴ has traced back the usage of many of these names; as has L. H. Bailey in his paper "De Cucurbitis Domesticatis — I."⁵

It is very likely that the *pepos* were the first to be introduced into Europe and among the earliest was the small, apple-shaped type of pumpkin now represented by "Perfect Gem." Described by Fuchs in 1542 and by Tragus ten years later, this form seems also to have been the "maycock" of early Virginian reports. The Bush Scallop or Cympling type was apparently known to Bauhin in 1561 and is the "buckler" or "simnel gourd" of Ray in 1686. The Connecticut Field types, or as Burr in 1863 called them the "Canada" and "Common Yellow" forms, were known shortly after the middle of the 16th century to Bauhin, Lobelius, Gerard, and others. Linnaeus in his *Species Plantarum* cited a cut from Dalechamps (1586 or 1587) which is a reversed picture of a cut in Mathioli (1560).

The *moschatas* soon followed, Large Cheese being apparently known to Lobelius in 1591, as was, according to Sturtevant's views, a form similar to Tennessee Sweet Potato. The striped Winter Crookneck was probably the "ecushaw" of Thomas Hariot in his "Narrative of the First English plantation of Virginia," first printed in London in 1588, and was almost certainly the form recorded by Ray (1686) who received seeds from Sir Hans Sloane and planted them in his garden.

The early records for the *maximas* are rather scarce though plates from Lobelius' *Icones* (1581) and Bauhin's *Historia* (1619) are listed as illustrating this species by later writers and are recognizable as to type of flower, leaf and fruit. The turban variety was apparently also seen by Bauhin in 1607.

In northeastern America the *maximas* seem not to have been known and all early records point to an extensive use of *pepos* and *moschatas*. Such early references as have been made to Hubbard-like forms may well refer to forms of *pepo* like Nantucket. The general use of squashes, in the strict sense of forms of *C. maxima*, began with the introduction of Acorn, Valparaiso and other South American forms by Yankee sailors early in the 19th century.

Of the *pepos*, curiously enough the crookneck does not appear with certainty in literature until 1828 when, according to Sturtevant, it was listed by Thorburn, though scallops or cymplings, the large yellow types, and the rough green Nantucket-like forms were all noted by early colonists. The vegetable marrows, both English and Italian forms, are also apparently fairly recent developments as are the so-called "fall squashes" of both *maxima* and *pepo* types.

Paralleling the controversy over the American origin of the squashes has been the discussion of the origin of the Bur Gherkin (*Cucumis Anguria*) still occasionally called the West Indian Gherkin. That its wild counterpart has not been found in Africa is of little significance compared to the facts that all its near allies are African, that there are no American relatives, and that it has been found in America only where it could have been introduced by the negroes or through their more or less direct agency. Both Hooker and DeCandolle believed the Gherkin to be of African origin and no evidence has been offered other than mere arbitrary statements for an American origin. Like many another plant from the Old World it has apparently found conditions in America well adapted for its dissemination and so-called wild specimens are undoubtedly adventive. It is unquestionably of African origin and was introduced into the warmer parts of America in the 16th century.

The cucumber (*Cucumis sativus*) or the primitive form from which it descended, probably originated in Africa but very early spread to Asia where it has been found wild in Northern India and where according to DeCandolle, it has been cultivated for three thousand years. It was grown by the ancient Greeks and Romans. In the Caucasus region there are names for the cucumber that indicate knowledge of the plant before it was known to the Sanskrit, but there seems to be no certain evidence that it was known to the ancient Egyptians. It was cultivated throughout most of Europe in the Middle Ages. Many of the forms grown at the time of the early herbals seem to have been less symmetrical and more rugged than those grown today, though Mathioli (1560) and Bauhin (1650) show figures of types very like some of our modern improved varieties. A half dozen or more types seem to have been known in Europe in the 16th century.

The melon (*Cucumis Melo*) also originated in tropical Africa. DeCandolle in his "Origin of Cultivated Plants" says "several forms found wild which have been described as species, must be the types and sources of the cultivated forms; and Naudin makes the very just observation that these wild types which differ more or less from one another may have produced different cultivated varieties. This is the more probable since they sometimes inhabit countries as remote from each other as Southern Asia and tropical Africa, so that differences in climate and isolation have created and consolidated varieties." However, with three rather dubious exceptions, all species of *Cucumis* are definitely of African origin and the closest allies of these three are native African species. There can be no reasonable doubt of the origin of the genus in tropical Africa, though *C. Melo* and *C. sativus* apparently spread into Asia sufficiently early for rather typical forms to have

⁴ Sturtevant's Notes on Edible Plants — U. P. Hedrick. 27th Ann. Rept. N. Y. Agr. Exp. Station, Vol. 2. pt. 2. 1919.

Bailey, L. H., *Gentes Herbarum* 2: 63. 1929. This paper is a most delightful and informing discussion of cultivated Cucurbitas and one that should be read by all interested in these fascinating plants. To Dr. Bailey, both for his elucidation of many points of difficulty in the discussion just mentioned and for the privilege of consulting the excellent collection in his herbarium, the authors here wish to express their gratitude.

developed in that country.⁶ It seems very doubtful that the Egyptians, the Greeks, or the Romans knew the melon. Certainly no very tasty forms were known to them and it is not until after the Middle Ages that improved forms became sufficiently widespread to merit comment in the writings of the day, though Sturtevant cites Palladius in the early part of the 3rd century as noting the fruits as "sweet and odorous." He also states that in 1554, Amatus Lusitanus mentioned "thin skinned, thick skinned, red-fleshed and white-fleshed" forms, as well as early, late and winter melons. Yellow-fleshed sorts were noted by Dodonaeus in 1616 and green-fleshed by Marcgravius in 1648. Warted types were seen by Lobelius before 1570 and netted and ribbed sorts were named by Camerarius in 1586. Round, long, oval, and pear shaped melons were mentioned by Gerard (1597) and other types appeared frequently in literature during the next quarter century. There is little evidence of the popularity of melons before this time, the middle and close of the 16th century, and one may well believe that they were one of the plants most highly developed in this period of great garden interest. Don says that the melon has been cultivated in England since 1570. In the 17th century, frequent mention of melons is to be found in American literature and it would seem that the early introductions of the species by Europeans had been very popular with the Indians among whom melon culture spread rapidly at least along the seaboard.

The watermelon (*Citrullus vulgaris*) and the white-flowered gourd (*Lagenaria siceraria*) are cultivated

to but a slight extent in New York State. Both are of African origin though the gourd must have spread to Asia in very early times, and both have a long history of culture. The watermelon was cultivated in ancient Egypt and has for ages been a favorite fruit of the African negroes. It seems to have been introduced into Europe at about the beginning of the Christian era and by the 16th century was cultivated wherever it could be grown satisfactorily. Sturtevant thought that the watermelon had nearly reached the height of its development by that time and that very little had been done in the way of improvement of varieties since. Its culture has spread widely in warmer and warm temperate parts of America where climatic and soil conditions seem to have been especially favorable. In this State it is grown largely for home use or for the local market.

The gourd is grown in New York for some of the larger city markets and occasionally in the home garden. It became known to the Romans about the beginning of the Empire and was probably not known to the ancient Greeks. DeCandolle remarks that it was much more widely grown in Europe in the 16th century than at present. As a food plant the vegetable marrows, though no easier of culture and less prolific, have largely taken its place because of their superior quality.

Further notes on the horticultural history of the various groups of cucurbits treated in this volume will be found associated with the discussion of varieties, where they may more properly be associated with the types now cultivated.

⁶ The origin of the whole family of *Cucurbitaceae* presents an interesting study as approximately 2/5 of the genera known are from Africa, 2/5 from America and the other 1/5 largely from tropical Asia. This distribution lends color to the suggestion that Africa and South America were once united and to the idea that the *Cucurbitaceae* arose in this united plant province and spread later to Asia with a few genera still later differentiating north and south of the original habitat.

SYSTEMATIC BOTANY OF THE CULTIVATED CUCURBITS

The plant family (*Cucurbitaceae*) constitutes one of the most interesting assemblages of plants known. Many of its members develop a tremendous vegetative growth and a remarkable amount of fruit from an apparently insignificant and inadequate root system; and the floral structures have rendered its relationships a matter of debate among botanists ever since a natural system of classification was first attempted.⁷ The wide spread of this family through the tropics would indicate a considerable age, but many of the sub-groups seem to show by their extreme variability and genetic fluidity that the group is in an evolutionary flux.

The family is divided into five tribes (in the Engler system of classification) each of which contains some plants of economic significance, especially in the Tropics. To the dweller in the temperate zones, however, only one of these tribes, the *Cucurbiteae*, assumes real importance. Here are gathered the gourds, pumpkins, squashes, vegetable marrows, melons, cucumbers, water-melons, etc., — a group of fruits and vegetables which have pleased the palates of gourmets and intrigued the interest of plant students and breeders for many a generation. The vegetative parts of many species have drastic purgative qualities, and the seeds of a large number are rich in oils. Some species are useful ornamentals. The general characters of the family follow:

Cucurbitaceae Juss. Gen. 393. 1789.

Climbing herbs (rarely erect shrubs) generally equipped with branched tendrils, now considered modified branchlets; leaves alternate, palmately veined, entire or more or less divided; flowers usually but not always unisexual and with both kinds ordinarily on the same plant, regular, perigynous; corolla and calyx usually with the members united; stamens regularly 5 or 3 (by adnation of two pairs), rarely and irregularly 4; anthers sometimes straight but often curved or variously contorted; ovary usually 3- or 5-carpelled, sometimes irregularly 4 or 6, inferior; fruit a pepo, i.e., with a thick rind and a fleshy or spongy many-seeded center), rarely dehiscent.

About 90 genera and 700 species, mostly of the warmer parts of the world.

KEY TO TRIBES. (After Müller and Pax)

Anthers more or less distinct.

Stamens with filaments free or with some pairs united.

Filaments 5 (rarely 4) entirely free or united at the base.

I. Fevilleae.

Filaments 3 (rarely 2 or 4) by adnation of two pairs.

Pollen sacs straight or somewhat curved... *II. Melothrieae.*

Pollen sacs S or U shaped... *III. Cucurbiteae.*

Stamens with filaments united in a tube... *IV. Sicyoideae.*

Anthers united in a ring... *V. Cyclanthereae.*

The *Fevilleae*, Tribe I, is of interest only as a source of certain drugs and a few ornamentals.

The *Melothrieae*, Tribe II, contains among others three genera of some importance: *Melothria*, with a number of ornamental species, the small fruits of which are of minor value as food in the Tropics; *Cucumeropsis*, one species of which, *C. edulis* from tropical Africa, bears edible fruits a foot long and three inches thick; *Telfairea*, an African genus of two species, both of which produce oily edible seeds; and *Kedrostis*, an East Indian species which is said to have edible fruits.

The *Cucurbiteae*, Tribe III, contains the *Naras*, *Acanthosicyos horrida*, a leafless thorny erect shrub with edible seed and fruits which are about 5 inches in diameter and of a delicious subacid flavor; *Hodgsonia heteroclita* of Burma and the Himalayas also with edible seeds; and the more important gourds, squashes, etc., described in detail in the following pages.

The *Sicyoideae*, Tribe IV, is notable for the Chayote — the fruit of *Sechium edule* — a favorite vegetable in Central America, the culture of which has spread through the warmer parts of America and into the Mediterranean region in Europe. A related plant, the Tacaco, *Polakowskia tacaco*, from northern South America, has also somewhat similar edible fruits. *Coccinea*, a genus of about 14 species from Southern Asia and Africa, has several species of ornamental value; and the fruits of *C. cordifolia* (*C. indica*) are used in curries in India, while those of some, at least, of the African species are used to some extent as food.

The *Cyclanthereae*, Tribe V, contains a single genus of 30 or more species, of which, a variety of one, *Cyclanthera pedata* var. *edulis*, is cultivated in Peru and Bolivia for its large edible fruits.

KEY TO IMPORTANT GENERA OF THE TRIBE
CUCURBITEAE

Lobes of corolla fimbriate.....1. *Trichosanthes*
Lobes of corolla not fimbriate;

Corolla rotate;

Calyx tube of staminate flowers much lengthened...2. *Lagenaria*

Calyx tube of staminate flowers short;

Stamens attached to throat of calyx.....3. *Momordica*

Stamens inserted in calyx tube;

Flowers in racemes.....4. *Luffa*

Flowers solitary or fasciculate;

Calyx lobes somewhat leafy, serrate, recurved.

5. *Benincasa*

Calyx lobes subulate, entire;

Tendrils 2-3 fid, connective short.....6. *Citrullus*

⁷ Comparatively recent papers which should be consulted are: The series of articles on Cucurbits by various authors in the "Bulletin of Applied Botany, of Genetics and Plant-breeding," volume 23, No. 3, pp. 1-560. Leningrad 1930; and also the paper on the "Cultivated Plants of Mexico, Guatemala, and Colombia" by Bukasov et al. (especially chapter 19 on the *Cucurbitaceae*) Supplement 47, to the same journal, 1930.

The Russian agriculturists writing in the publications mentioned have used a system of classification and a series of Latin names (mostly for the purpose of designating geographic races or other groups within the various species which are, for the purposes of this account, too involved to warrant inclusion and explanation, although their study is bringing out facts which must be considered in a monographic study of the Cucurbits.

- Tendrils simple, connective produced beyond the pollen sacs.....7. *Cucumis*
 Corolla campanulate;
 Anthers free.....8. *Sicana*
 Anthers united.....9. *Cucurbita*

1. **TRICHOSANTHES** L. *Sp. Pl.* 1008. 1753.—
Cucumeroides Gaertn. *Fruct.* 2:485. 1791. *Involucrararia* Ser. *Mem. Soc. Phys. Gen.* 3¹:25. 1825.
Eopepon Naud. *Ann. Sci. Nat.* V. 5:31. 1866.
Platygonia Naud. *l. c.* 33.—*Trichosanthes* St.-Lag.
Ann. Soc. Bot. Lyon. 7:56. 1880.

Annual or perennial herbs, monoecious or dioecious; tendrils 2-5, branched; rarely simple; leaves simple, entire or lobed or compound; flowers white, the pistillate solitary, the staminate sometimes racemose; calyx tube long cylindrical, dilated above; corolla 5-lobed or parted, the lobes often fimbriate; stamens 3; ovary 1-celled with 3 parietal placentae, style long, stigmas 3, occasionally 2; fruit fleshy with numerous seeds.

There are about 50 species of this Asiatic genus of which only the following is of particular interest here, though several others are reported to have edible fruit.

T. Anguina L. *Sp. Pl.* 1008. 1753. Snake Gourd. *Cucumis Anguina* L. *Sp. Pl. ed. 2.* 1437. 1763. *Trichosanthes colubrina* Jacq. f. *Eclog.* t. 128. 1844. *Involucrararia Anguina* M. Roem. *Syn. Pepon.* 97. 1846.

Annual climbing or long-running herb; leaves deltoid- or broad-ovate, deeply cordate, apiculate dentate, slightly sinuate and sometimes shallowly 3-lobed, glabrate to glabrous, 4-9 inches long; flowers long-peduncled, 2 inches or more across; fruit 1-6 feet long, slender, more or less contorted, greenish-white, glabrous; seeds $\frac{1}{2}$ inch long, rather thick, the edges scalloped.

2. **LAGENARIA** Ser. *Mem. Soc. Phys. Gen.* 3¹: 25. 1825.

Only one species known:

L. siceraria (Molina) Standl. *Field Mus. Pub. Bot.* 3:435. 1930. White-flowered Gourd.—*Cucurbita lagenaria* L. *Sp. Pl.* 1010. 1753. *C. siceraria* Molina *Sagg. Chil.* 133. 1782. *C. leucantha* Duch. in Lam. *Encycl.* 2:150. 1786. *Pepo lagenarius* Moench, *Meth.* 653. 1794. *Cucurbita idolatrica* Willd. *Sp. Pl.* 4:607. 1805. *C. pyrotheca* Hort. ex Steud. *Nom.* 245. 1821. *Lagenaria vulgaris* Ser. *l. c.* 25. 1825. *Cucurbita vittata* Blume, *Bijdr.* 932. 1826. *Lagenaria idolatrica* Ser. in D. C. *Prod.* 3:299. 1828. *L. vittata* Ser. *l. c.* *Cucumis bicirrhia* Forst. ex Guill. *Zeph. Tahit.* 56. 1836. *Lagenaria cochinchinensis* M. Roem. *Syn. Pepon.* 13. 1846. *Cucurbita pyri-formis* Roem. *l. c.* 89. *Lagenaria microcarpa* Naud. *Rev. Hort.* 65. 1855. *L. verrucosa* Hort. ex *Gartenfl.* 39:106. 1890. *L. Lagenaria* Cockerell, *Bull. Torr. Club.* 19:95. 1892. *L. virginialis* Hort. ex *Gard. Chron.* III. 11:85. 1892. *L. leucantha* Rusby, *Mem. Torr. Club.* 6:53. 1896.

Annual herbaceous vine, viscid pubescent, musky-scented, with branched tendrils; leaves cordate-ovate to reniform-ovate, sometimes shallowly lobed, apiculate-dentate, 6-12 inches across; flowers solitary, monoecious, (rarely dioecious) white, 2-4 inches across; petals 5; ♂ flower long-petioled; anthers lightly cohering but not connate; ovary with 3 placentae; fruit variously shaped, many seeded.

Native to the Old World Tropics, the culture of the white flowered gourds has spread throughout the warm and temperate regions of the whole earth. While some forms are edible and are to be found on the markets of most large cities, others are grown only for the hard-shelled ripe fruits or gourds. These vary in size from 3 inches to 10 or 15 times that length and in shape from disk-like to globular, club-shaped, bottle-shaped, and variously coiled and contorted forms. The edible types are easy of culture and general in distribution though the vegetable marrows have, because of their higher quality, tended to supplant the *Lagenaria* in many places.

3. **MOMORDICA** L. *Sp. Pl.* 1009. 1753. *Zucca* Commers. ex Juss. *Gen.* 398. 1789. *Muricia* Lour. *Fl. Cochinch.* 2:596. 1790. *Neurosperma* (*Nevrosperma*) Raf. *Am. Mo. Mag.* 40. 1818. *Neurospermum* Bartl. *Ord.* 275. 1830.

Annual or perennial climbing or long-running herbaceous vines; leaves entire, lobed, or palmately compound with 3 to 9 leaflets; tendrils simple or bifid; flowers monoecious or rarely dioecious, yellow or occasionally white, the peduncle often furnished with large bracts, ♂ flowers solitary, racemose or corymbose, ♀ solitary; corolla rotate to open campanulate, 5-parted to the base, or more rarely 5-lobate, 2 of the segments wider than the others; stamens 3, rarely 2 (or 5 by failure of the filaments to adhere); ovary with three placentae, style slender, stigmas 3 entire or bifid; fruit oblong or nearly spherical, often spiny tuberculate, usually indehiscent but occasionally trivalvate; seed few to many.

Over 60 species native to the tropics of the Old World, of which the following two are commonly cultivated in the United States both for ornamental use and the food value of the fruits.

1. **M. Balsamina** L. *Sp. Pl.* 1009. 1753. Balsam-apple. *Neurosperma cuspidata* Raf. *Journ. Phys.* 101. 1819. *M. gariepensis* E. Mey. ex Drege, *Zwei. pfl.-geogr. Dok.* 202. 1844.

Annual, monoecious vine with simple tendrils; branches slender, glabrous, long; leaves thin, glabrous, broadly deltoid-ovate to cordate-obcordate in outline, 3- to 5-lobed with broad sinuses, acute-mucronate, 2-4 inches across; flowers orange yellow with darker center, ♂ 1-1 $\frac{1}{4}$ inches across with very slender long (1 $\frac{1}{4}$ -2 $\frac{1}{2}$ inches) peduncles, having a serrate bract on the upper portion, ♀ smaller with bractless short ($\frac{1}{4}$ - $\frac{1}{2}$ inch) peduncles; fruit broadly ovoid, 1 $\frac{1}{2}$ -3 inches long, crested, tuberculate, or sometimes nearly smooth, orange.

2. **M. Charantia** L. *Sp. Pl.* 1009. 1753. Balsam Pear. *M. indica* Stickm. *Herb. Amb.* 24. 1754. *M. elegans* Salisb. *Prod.* 158. 1796. *M. anthelmintica* Schum. & Thonn. *Beskr. Guin. Pl.* 423. 1827. *Cucumis intermedius* Roem. *Syn. Pepon.* 880. 1846. *M. Jagorana* C. Koch, *Wochenschr.* 45, 1858. *M. chinensis* (*sinensis*) Hort. ex Bull. Soc. Tosc. Ort. 18:14. 1893. *Sicyos Fauriei* Lev. in Fedde, *Rep. Spec. Nov.* 10:150. 1911.

Somewhat similar to *M. Balsamina* but with larger more deeply lobed leaves, ♂ flowers with an entire bract below the middle of the slender peduncle; fruit oblong or oval, 4-8 inches long, orange-yellow covered with blunt tubercles, dehiscent apically into 3 valves at maturity, then showing the scarlet arils of the numerous seeds.

4. **LUFFA** Adans. *Fam.* 2:138. 1763. *Turia* Forsk. *Fl. Aeg.-arab.* 165. 1775. *Trevouxia* (*Tre-*

vauxia) Scop. *Intr.* 152. 1777. *Amordica* Neck. *Elem.* 1:241. 1790. *Poppya* Neck.

Monoecious annual vines with branched tendrils; leaves 5- to 7-lobed, rarely sub-entire; flowers yellow rarely white, rather large, ♂ racemose, ♀ solitary; corolla of 5 free petals; stamens 3, rarely 4 or 5; ovary with 3 placentae; stigmas 3, bilobate; fruit dry, oblong or cylindrical, the interior fibrous; seeds numerous. Of the 8 species known all (except one) are conceded to have originated in the tropics of the Old World. The one exception, *L. operculata*, is known to date only from Tropical America, but it, too, probably originated in the Old World. Only one species is commonly cultivated in this country.

Luffa cylindrica (L.) M. Roem. *Syn. Pepon* 63. 1846. Rag-Gourd. *Momordica cylindrica* L. *Sp. Pl.* 1009. 1753. *M. Luffa* L. *l. c.* *Turia cordata* J. F. Gmel. *Syst.* 403. 1791. *T. cylindrica* J. F. Gmel. *l. c.* *L. aegyptiaca* Mill. *Gard. Dict. ed. gall.* 4:500. 1785. *Cucumis lineatus* Bosc. *Journ. His. Nat.* 2:251. 1792. *Momordica reticulata* Salisb. *Prod.* 158. 1796. *L. pentandra* Roxb. *Hort. Beng.* 70. 1814. *L. scabra* Schum. & Thonn. *Beskr. Guin. Pl.* 405. 1827. *Momordica carinata* Vell. *Fl. Flum.* 10: t. 97. 1827. *L. Petola* and *L. Cattu-Picinna* Ser. in D. C. *Prod.* 3:303. 1828. *Byronia cheirophylla*, *Cucumis acutangulus*, *Luffa amara* and *L. hederacea* Wall. *List.* 1832. *L. Satpatia* and *L. Parvala* Buch.-Ham. in Wall. *l. c.* *L. clavata* and *L. racemosa* Roxb. *Fl. Ind.* 3:714 and 715. 1832. *Cucumis pentrandus* Roxb. ex Wight. & Arn. *Prod.* 1:343. 1834. *L. striata* Schrad. *Ind. sem. Gott.* 1835. *Cucumis megacarpus* G. Don, *Gen. Syst.* 3:28. 1836. *L. foetida* Jacq. f. ex Schrad. *Linnaea* 12:405. 1838. *L. Jacquini* Schrad. *l. c.* *L. vittata* Zipp. ex Span. *Linnaea* 15:206. 1841. *L. leucosperma* Roem. *Syn. Pepon.* 63. 1846. *L. insularum* A. Gray, *U. S. Exp.* 1:644. 1854. *L. sylvestris* Miq. *Fl. Ind. Bot.* 1:666. 1856. *Poppya Fabiana* K. Koch *Berl. Allg. Gart.* 60. 1857. *L. leiocarpa* F. Muell. *Fragm.* 3:107. 1862. *Karivia? longicirra* Miq. *Prol. Fl. Jap.* 12. 1866. *L. Veitchii* Naud. *Rev. Hort.* 58. 1873.

Stem 6 to 15 feet long, 5-angled, slender, smooth but the angles scabrous; leaves deltoid to nearly orbicular in outline but acute or acuminate at the apex, usually more or less deeply 3-7 lobed, dentate, scabrous; flowers yellow, 2-4 inches across, ♂ and ♀ in the same leaf axils; fruit fusiform, cylindrical, or elongate-clavate, not ribbed but usually with light furrows and stripes, 1-2 feet long.

Like most of the other species in the genus the fruit is edible when young but finds a wider use in the United States as an ornamental vine. The dried inner fibrous portion of the fruit is used as a sponge, a use which has given the plant such names as Rag-Gourd, Vegetable Sponge, and Dish-cloth Gourd.

5. BENINCASA Savi. *Bibl. Ital.* 9:158. 1818.

Only one species is known, the description of which will include the generic characters.

Benincasa hispida (Thunb.) Cogn. in DC. *Mon. Phan.* 3:513. 1881. Chinese Preserving Melon. White Gourd. *Cucurbita hispida* Thunb. *Fl. Jap.* 322. 1784. *C. pruriens* Sol. ex Forst. *Prod.* 92:1786. (nomen). *B. cerifera* Savi *l. c.* *B. cylindrica* Hort ex Ser. *Mem. Phys. Gen.* 3:1. 1825. *Cucurbita villosa* Blume, *Bijdr.* 931. 1826. *C. farinosa* Blume *l. c.* *Lagenaria hispida* Ser in DC. *Prod.* 3:303. 1828. *Cucurbita Camolenga* Buch.-Ham. in Wall. *Dist.* 1932. *C. alba* Roxb. ex Wight & Arn. *Prod.* 1:344. 1834. *C. Pepo-aspera* Blanco *Fl. Filip.* 773. 1837. *C. littoralis* Hassk. *Cat. Hort. Bogor.* 190. 1844. *Gymnopetalum septemlobum* Miq. *Fl. Ind. Bot.* 1:679. 1855. *Lagenaria dasystemon* Miq. *Prol. Fl. Jap.* 13. 1866. *Cucurbita vacua* F. Muell. *Fragm.* 6:186. 1868. *B. vacua* F. Muell. *Cens. Austr. Pl.* 76. 1882.

Monoecious long-running annual, with branched tendrils and brown-hairy stems; leaves palmately veined, 5-angled, reniform-ovate to nearly pentagonal-orbicular, strongly cordate, hirsute or glabrate, apiculate dentate; flowers solitary, yellow, 3-4 inches across, ♂ long pedunculate; ♀ short pedunculate; petals 5, anthers free, ovary with 3 placentae; fruit nearly spherical to oblong; 10-20 inches long, 4-10 inches thick, white waxy, hairy, greenish or marbled with white; seeds numerous. The fruit is used mostly in pickles and preserves.

6. CITRULLUS^s Forsk. *Fl. Aeg.-arab.* 167. 1775. *Anguria* Mill. *Gard. Dict. abr. ed.* 4. 1754. *Colocynthis* Ludw. *Inst. Regn. Veg. ed.* 2. 139. 1757.

Monoecious or dioecious, long-running annual or perennial herbs with or without tendrils; leaves deeply 3-7 lobed, pinnatifid, roundish or deltoid-ovate in outline; flowers yellow, short pedunculate, ♂ and ♀ solitary, rarely fasciculate; sepals 5; corolla deeply 5-parted, rotate or broad-campanulate, stamens 3, anthers free or lightly coherent; ovary with 3 placentae, stigmas 3, thick, somewhat bilobate; fruit globose or oblong, fleshy or dry, many seeded.

Of the four species of this genus only the following species is of importance in America though *C. Colocynthis*, the colocynth, has been grown to a slight extent.

Citrullus vulgaris Schrad. in Eckl. & Zeyh. *Enum.* 279. 1836. Watermelon. *Cucurbita Citrullus* L. *Sp. Pl.* 1010. 1753. "*Citrullus battich* of Forsk. *Fl. Aeg.-arab.* 167. 1775" fide some later auth. *Anguria Citrullus* Mill. *Gard. Dict. ed. 8. corr.* 1768. *Cucurbita Anguria* Duch. in Lam. *Encycl.* 2:158. 1786. *C. pinnatifida* Schrank, *Regensb. Syll. Pl.* 1:190. 1824. *Citrullus Pasteca* Sag. *Am. Sci. Nat. I.* 8:312. 1826. *Cucumis amarissimus* Schrad. *Ind. Sem. Gott.* 1827. *C. Citrullus* Ser. in DC. *Prod.* 3:312. 1828. *C. laciniosus* Eckl. ex Schrad. *l. c.* *Cucurbita caffra* Eckl. & Zeyh. *Enum.* 279. 1836. *Citrullus caffer* Schrad. *Ind. Sem. Gott.* 1834. *Cucumis dissectus* Decne. *Ann. Mus. Paris* 3:449. 1834. *Citrullus chodospermus* Fal. & Dunal, *Bull. Soc. Agr. Herault.* 264. 1836. *C. Caffrorum* Schrad. *Linnaea* 12:413. 1838. *C. edulis* Spach. *Hist. Nat.*

^s The name *Citrullus* is here used as the most familiar generic term for the watermelon, despite the fact that there are two earlier names. The disposition of one of these names is involved in a resolution which has been referred to a committee on nomenclature appointed at the 1935 International Botanical Congress. Until that committee's report has been received and accepted, it seems wise to use the name generally used, even though it is technically invalid. The use of the specific name is, of course, also involved in the action on the generic name. The name here used is the one usually found in manuals, etc.

Veg. Phan. 6:214. 1838. *C. fistulosus* Stocks in Hook. *Journ. Bot.* 3:74. 1851. *C. Citrullus* Karst. *Pharm. Bot.* 889. 1883. *Colocynthis Citrullus* Kuntze, *Rev. Gen.* 1:256. 1891. *Citrullus aedulis* & *C. colocinthoides* Pangolo, *Bull. Appl. Bot.* 23:81. 1930.

Annual vine with hirsute long-running stems and branched tendrils; leaves deeply trifid with the lobes pinnatifid or bipinnatifid, slightly scabrous on both sides, 4-7 inches long, peduncles shorter than blades; flowers $1\frac{1}{2}$ inches across, rotate, 5-lobed; fruit globular or oblong, glabrous, green more or less marked with white stripes or netting, flesh yellow, orange, or red, sweet, edible. There are two well marked forms:

1a. *C. vulgaris* var. *citroides* Bailey, *Gent. Herb.* 2:186. 1930. Citron or Preserving Melon. Similar but fruit smaller, flesh white, solid, not edible raw; seeds not marbled as often as are those of the watermelon.

1b. *C. vulgaris* var. *lanatus* Bailey. *Gent. Herb.* 2:87. 1929. *Momordica lanata* Thunb. *Prod. Fl. Cap.* 13. 1794. *Citrullus amarus* Schrad. in Eckl. & Zeyh. *Enum. Pl. Afr.* 279. 1835.

The bitter or wild native watermelon of South Africa.

7. CUCUMIS L. *Sp. Pl.* 1011. 1753. *Rigocarpus* Neck. *Elem.* 1:238. 1790. *Hymenosicyos* Chiov. *Ann. di. Bot.* 9:62. 1911.

Annual or perennial trailing or rarely climbing herbs; monoecious, sometimes dioecious, or very rarely perfect flowered, ♂ flowers clustered or rarely solitary, ♀ solitary or occasionally clustered; corolla rotate or subcampanulate, 5-parted, stamens 3, free; staminodes of the ♀ flowers 3, setiform or ligulate, ovary with 3-5 placentae and an equal number of stigmas; fruit generally fleshy, usually but not always indehiscent, globular to elongate, glabrous, pubescent or echinate; seeds numerous.

This genus of African origin consists of nearly 40 species, two of which are now known in a wild or semi-wild state only from India and one only from America. Besides the important edible forms which are confined largely to the three species distinguished in the following key, a fourth species, the Teasel Gourd, *C. dipsaceus*, is sometimes grown for ornamental purposes. It is a slender vine with leaves resembling those of *C. Melo* and dry bristly bur-like fruits about $1\frac{1}{2}$ inches long.

KEY TO IMPORTANT SPECIES OF CUCUMIS

Fruit spiny, muricate, or echinate

Leaves deeply lobed, sinuses obtuse 1. *C. Anguria*

Leaves at most shallowly lobed, sinuses acute.

Fruit edible, somewhat prickly 2. *C. sativus*

Fruit inedible, bristly hairy 3. *C. dipsaceus*

Fruit glabrous or pubescent, the surface smooth, ribbed, netted, or somewhat tuberculate but not spiny in any degree 4. *C. Melo*

1. *Cucumis Anguria* L. *Sp. Pl.* 1011. 1753. Bur Gherkin. *C. echinatus* Moench, *Meth.* 654. 1794. *C. parviflorus* Salisb. *Prod.* 157. 1796. *C. augurioides* M. Roem. *Syn. Pepon* 79. 1846. "*C. Arada* L." Naud. & Muell. *Man. Accl.* 230. 1887.

Monoecious, trailing annual with slender, rough, hairy, angled stems and small tendrils; leaves deeply 3-5 lobed, the latter often

again lobed, sinuses rounded, scabrous; flowers $\frac{1}{8}$ - $\frac{1}{2}$ inch across, ♂ fasciculate rarely solitary with slender peduncle, ♀ solitary with stouter hirsute peduncle; fruit oval or oblong, $1\frac{1}{2}$ -2 inches long, pale yellow when mature, sometimes striped with green, furrowed, prickly.

This species, sometimes known as the "West India Gherkin," is known in a seemingly wild state only from tropical America but as noted in the preceding chapter is probably of African origin. It is sometimes used in pickles in the United States but more often the "gherkins" found on the market are small fruits of various varieties of *C. sativus*.

2. *Cucumis sativus* L. *Sp. Pl.* 1012. 1753. Cucumber. *C. esculentus* Salisb. *Prod.* 157. 1796. *C. muricatus* Willd. *Sp. Pl.* 4:613. 1805. *C. Hardwickii* Royle, *Ill. Himal. Pl.* 1:220. 1839. "*C. Vilmorinii* Hort." *Bull. Soc. Tosc. Ort.* 19:115. 1894.

Monoecious annual trailing or climbing vine with angled hirsute stems; leaves cordate- or deltoid-ovate, more or less 3- to 5-lobed, the sinuses acute, scabrous; flowers $1-1\frac{1}{2}$ inches across, ♂ clustered with slender peduncles, ♀ usually solitary and with stouter short peduncles; fruit nearly globular to oblong or cylindrical, usually slightly curved, often obtusely trigonous, mature specimens often with very slight traces of spines or tubercles.

The wild form considered by many as most typical is that described originally as *C. Hardwickii* from the mountains of northern India. Granting an African origin of the genus, this species must have spread early into Asia or possibly have developed there from a more generalized type.

As a botanical variety *C. sativus anglicus*, Bailey has named the English forcing type of cucumber, noteworthy because of its long fruits up to 3 feet, and somewhat larger leaves and flowers. It is not tetraploid despite the appearance of being so.

The horticultural varieties of this species are treated in a subsequent chapter of this volume, hence it is necessary here only to remark that Seringe (*DC. Prod.* 3:300. 1828) gave Latin names to five groups; Naudin (*Ann. Sci. Nat.* IV. 11:28. 1859) found four outstanding forms; Alefeld (*Landw. Fl.* 196. 1866) gave Latin names to 14 forms in 3 groups; and the Russian workers in the papers noted in footnote 7 have named still other forms.

3. *C. dipsaceus* Ehrenb. in Spach, *Hist. Veg. Phan.* 6:211. 1838. Teasel Gourd. *C. Bardona* Fenzl. ex Naud. *Ann. Sci. Nat.* IV. 11:25. 1859. *C. ambigua* Fenzl. ex Hook. f. in Oliver, *Fl. Trop. Afr.* 2:543. 1871. *Momordica dasycarpa* Hochst. ex Rich. *Fl. Abyss.* 1:291. 1847.

Annual, monoecious, trailing vine; stems angled, setose; leaves more or less broad- or reniform-ovate, $3-4\frac{1}{2}$ inches across; flowers small, on long, slender peduncles, ♂ solitary or fasciculate, ♀ solitary; fruit 1-2 inches long, hard, bur-like, ovoid-cylindrical, pale yellowish when mature, densely covered with bristly hairs; seeds very small, numerous.

This plant, from north eastern Africa and adjacent Asia, is occasionally grown for ornament. It is sometimes known as Hedgehog Gourd.

4. *Cucumis Melo* L. *Sp. Pl.* 1011. 1753. Melon. *C. Dudaim* L. *l. c.* *C. Chate* Hass. *It. Pal.* 591. 1751. *C. flexuosus* L. *Sp. Pl. ed. 2.* 1437. 1763. *C. officinarum* Crantz, *Inst. t.* 172. 1766. *C. acidus* Jacq. *Obs. Bot.* 4:14. 1771. *C. pictus* Jacq. *Hort. Vind.* 3:6. 27. 1776. *C. Conomon* Thunb. *Fl. Jap.* 324. 1784. *Cucurbita aspera* Sol. ex Forst. *Prod.* 554. 1786. *Cucumis odoratissimus* Moench, *Meth.* 654. 1794. *C. deliciosus* and *C. umbilicatus* Salisb. *Prod.* 157. 1796. *C. pubescens* and *C. maculatus* Willd. *Sp. Pl.* 4:614. 1805. *C. campechianus* HBK. *Nov. Gen. & Sp.* 2:123. 1817. *C. moschatus* S. F. Gray, *Nat. Arr. Br. Pl.* 2:552. 1821. *C. jamaicensis* Bert. ex Spreng. *Syst. Veg.* 3:46. 1826. *C. persicodorus* Seiz, and *C. serotinus* Haberle ex Seiz. *Verh. Ver. Bef. Gart.* 379 and 376. 1827. *Concombre Arada* Descourt. *Fl. Antill.* 5:91. 1827. *Cucumis reflexus* Leyh. ex Ser. in DC. *Prod.* 3:300. 1828. *C. Cantalupo* Reichb. *Fl. Germ. Exc.* 295. 1830. *C. Gurmia* and *C. Chaete* Wall. *List.* 1832. *C. Momordica* and *C. utilissimus* Roxb. *Fl. Ind.* 3:720 and 721. 1832. *Momordica sativa* Roxb. ex Wight & Arn. *Prod.* 1:341. 1834. *Cucumis pedatifidus*, *C. Reginae* and *C. cubensis*, Schrad. *Linnaea* 12:418, 419. 1838. *C. aromaticus* Royle, *Ill. Bot. Himal.* 2:220. 1839. *C. princeps* Wend. *Ind. Sem. Hort. Marb.* 1840. "*C. bucharicus*, *C. Cantalon*, *C. erivanicus*, *C. reticulatus*, *C. saccharinus*, *C. verrucosus*, and *C. viridis* Hort." Steud. *Nom.* 451. 1840. *C. maltensis* Ser. ex Steud. *l. c.* *C. cantalupensis* Haberle ex M. Roem. *Syn. Pepon.* 69. 1846. *C. persicus* and *C. Schraderianus* Roem. *l. c.* 71 and 73. *Melo sativus* Sag. ex Roem. *l. c.* 68. *Cucumis Chito* Morren, *Ann. Gand.* 5:339. 1849. *C. cica-trisatus* Stocks, *Journ. Bot.* 4:148. 1852. *C. eriocarpus* and *C. villosus* Boiss. & Noe, *Diagn.* II. 2:59. 1856. *C. picrocarpus* and *C. jucunda*, F. Muell. *Trans. Phil. Soc. Vict.* 3:46. 1859. *C. Pancherianus* Naud. *Ann. Sci. Nat.* IV. 12:112. 1859. *C. ambigua* Fenze ex Hook. f. *Fl. Trop. Afr.* 2:543. 1872. *C. chinensis* Pangolo. *Bull. Appl. Bot.* 23³:559. 1930.

Annual trailing vine, with soft hairy to nearly glabrous striate or angled stems; leaves suborbicular to nearly reniform, generally 5-angled, occasionally very shallowly 3- to 7-lobed, soft villous to slightly scabrous on both sides, 3-5 inches across; flowers about 1 inch across, monoecious or andromonoecious (the first 2 or 3 flowers of some forms being perfect), ♂ often fasciculate and usually on slender peduncles, ♀ and ♂ usually solitary on short stout peduncles; corolla lobes obtuse to slightly acute; fruit various.

The species varies a great deal and has been variously treated by students. A convenient (but phylogenetically impossible) grouping places all forms first into two categories:

- (a) *C. Melo agrestis* Naud. *Ann. Sci. Nat.* IV. 11:73. 1859.

This includes the slender-vined, wild or run-wild types with small flowers and small inedible fruit.

- (b) *C. Melo cultus* Kurz. *Journ. As. Soc. Beng.* 46²:107. 1877.

Here are included the stouter-vined, larger-flowered, larger-fruited edible types.

The second group or category has also been variously treated, notably by Naudin (*Ann. Sci. Nat.* IV. 11:34. 1859). His grouping is here followed as closely as possible for the types cultivated in the United States. The important forms are:

(a) *reticulatus* Naud. Netted or Nutmeg Melons. Fruits of medium size, the surface more or less strongly netted, often furrowed lengthwise; rind fleshy, with tough skin. This group includes most of the melons cultivated in New York State. They are not cantaloupes as they are so often erroneously called. The Persian melons now grown in California and occasionally found on the eastern markets are a stronger growing, larger-fruited race allied to this group.

(b) *cantalupensis* Naud. Cantaloupes. Fruits of medium size, the surface rough, warty, or scaly, but not netted; the rind hard. The true cantaloupes are not grown in this State; nor, indeed, are they grown commercially anywhere in the United States.

(c) *inodorus* Naud. Winter Melons. Fruits smooth or rough, lacking musky odor, late ripening; leaves light or medium green, rather bullate, large. The winter melons fall into two sub-groups; the smooth fruited Honey Dew type and the rough fruited Cassabas. Few are raised in this State but many are imported from the Southwest.

(d) *flexuosus* Naud. Snake Melon. Fruit slender (1-3 inches) but long (1½-3½ feet), often curved or coiled. Sometimes used in preserving.

(e) *Conomon* Makino. Oriental Pickling Melon. Fruit smooth, glabrous, not musky, variously shaped. The name suggests its use. Rarely grown.

(f) *Chito* Naud. Mango Melon or Garden Lemon. Fruit small, cucumber-like, sometimes used in pickling. The common names are sufficiently descriptive: Orange-Melon, Vegetable-Orange, Melon-Apple, Vine-Peach, etc.

(g) *Dudaim* Naud. Dudaim Melon. Fruit about the size of the last, orange marked with rich brown, and very fragrant. Grown only for the ornamental perfumed fruit. Also known as Pomegranate-Melon, and Queen Anne's Pocket-Melon.

8. *SICANA* Naud. *Ann. Sci. Nat.* IV. 18:180. 1862.

The following is the only well-known species and its description will also serve for the genus. Two other forms, possibly varieties of the same species, have been noted.

1. *Sicana odifera* Naud. *l. c.* 181. Curuba or Cassabanana.

Perennial herbaceous vine with angled stems and 3- to 5-branched tendrils; leaves 5- to 9-lobed, nearly circular in outline, cordate, 5-12 inches across; flowers solitary, yellowish; ♂ flower with anthers free but connivent, 1½ inch long; ♀ flower with 3 stamens, 2 inches long; ovary with 3 placentae; stigmas 3, each 2-lobed; fruit long-oblong, 1-2 feet in length, nearly cylindrical, orange-crimson, with strong aroma; seeds numerous.

The fruit is edible but the plant is more largely grown in the United States for its ornamental value.

9. *CUCURBITA* L. *Sp. Pl.* 1010. 1753. *Pepo* Adans. *Fam.* 2:138. 1763. *Ozodycus* Raf. *Atlant. Journ.* 145. 1832. *Sphenantha* Schrad. *Linnaea* 12:416. 1838. *Pileocalyx* Gaspar. *Rendic. Acad. Sci. Nap.* 6:409. 1847. *Tristemon* Scheele, *Linnaea* 21:586. 1848.

Annual or perennial herbs with long-running, climbing, or short and bushy (through shortening of the nodes), more or less coarse-prickly angled or furrowed stems often rooting at the nodes; tendrils branched; leaves usually simple, shallowly to deeply lobed, occasionally palmately compound or nearly so, scabrous or pubescent, rarely glabrate; flowers normally monoecious, large, creamy-white to deep yellow, both calyx and corolla usually campanulate, normally 5 lobed; ♂ solitary or fasciculate, long-pedunculate, stamens usually 3, the anthers united — one unilocular and the others bilocular, sigmoid-flexuous, the filaments at least partly free; ♀ solitary, short-peduncled, staminoidia 3; ovary oblong or discoid, unilocular with 3 to 5 placentae, style short thick, stigmas 3 to 5 and bilobate; fruit fleshy or fibrous, indehiscent, seeds numerous, flat, smooth, generally white or buffy but in some species black, grayish or brown, ovate to oblong or nearly elliptic, the margin more or less thickened.

An American genus of tropical origin composed of the following species.

KEY TO THE KNOWN SPECIES OF CUCURBITA

Plants perennial:

Leaves narrowly triangular, entire to shallowly-lobed, truncate or nearly so at the base.

Calyx tube less than $\frac{1}{2}$ inch long, segments nearly 2 inches long; the corolla slightly exceeding the calyx segments; leaves thin, green. 1. *C. Galeottii*

Calyx tube more than $\frac{3}{4}$ inch long, segments somewhat shorter; the corolla about 3 inches long; leaves thick ashy-green; fruit 3-celled.

2. *C. foetidissima*

Leaves suborbicular to ovate in outline, more or less deeply lobed, the basal sinus generally deep.

Calyx tube long, narrowly sub-cylindric; leaves ashy-green; fruit 5-celled.

Lobes of leaves deltoid, the sinuses reaching about halfway to the base. 3. *C. palmata*

Lobes of leaves nearly linear, the sinuses reaching nearly or quite to the base. 4. *C. digitata*

Calyx tube short, campanulate; leaves pale or clear green above, not ashy; fruit 3-celled.

Lobes of leaves acute; fruit small, 2 to 3 inches in diameter. 5. *C. radicans*

Lobes of leaves rounded; fruit large, 4 to 6 inches in diameter. 6. *C. ficifolia*

Plants annual:

Flowers creamy white; slender climbing vine.

7. *C. okeechobeensis*

Flowers yellow; stout trailing vines or sometimes bushy.

Lower veins of leaf covered by prominently decurrent blade to point of union with the petiole.

8. *C. moschata*

Lower veins of leaf naked near junction with petiole.

Seeds small, less than $\frac{1}{4}$ inch long; black.

9. *C. Andreana*

Seeds larger, more than $\frac{1}{4}$ inch long, white, tawny or grayish.

Fruit stalk hard, ridged, pentagonal; leaves usually angled or deeply lobed; setae usually large and stiff. 10. *C. Pepo*

Fruit stalk more or less spongy, nearly cylindrical; leaves rounded, occasionally lobed but not angulate; setae generally small and often interspersed with soft hairs. 11. *C. maxima*

1. *Cucurbita Galeottii* Cogn. in DC. *Mon. Phan.* 3:551. 1881.

Perennial vine with thick angular somewhat bristly stems; leaves narrowly triangular lightly lobed, acute at the apex and truncate or nearly so at the base, deep green above, ashy green below, hirsute, sparingly so above and becoming glabrate, more densely so below, the nerves prickly, 5-7 inches long; flowers small; calyx tube narrowly campanulate less than $\frac{1}{2}$ inch long with subulate lobes slightly dilate at the apex up to 2 inches long; corolla slightly longer than the calyx lobes; fruit unknown.

2. *Cucurbita foetidissima* H. B. K. *Nov. Gen. & Spec.* 2:123. 1817. Calabazilla. *Ozodycus perennis* Raf. *Atl. Journ.* 145. 1832. *Cucumis perennis* James, in Long's *Exp. Rocky Mts.* 2:20. 1823. *Cucurbita perennis* A. Gray. *Pl. Lindh.* 2:193. 1850. *Pepo foetidissima* Britton *Ill. Fl. ed. 2* 3:291. 1913.

Perennial long-running vine with stout subcylindric stems reaching 15-20 feet in length; leaves triangular-ovate, cordate or truncate at base, acute at apex, somewhat ashy above and canescent below, 4-10 inches long; flowers solitary, rather large; calyx tube about $\frac{3}{4}$ inch long, lobes very narrow and slightly shorter than the tube; corolla 3-4 inches long; fruit 3-4 inches in diameter nearly globular.

Native to Northern Mexico and the Southwestern United States. The leaves were used medicinally by the Spanish and the carrot-shaped root is said to have been employed as a cleanser.

3. *Cucurbita palmata* S. Wats. *Proc. Am. Acad.* 11:137. 1876. Coyote Melon or Mock Orange. *C. californica* Torr. ex Wats. *l. c.* 138.

Perennial trailing vine with slender sulcate stems several feet long; leaves nearly suborbicular in outline palmately 5-cleft, ashy green above and canescent below, more or less densely short hirsute, 3-4 $\frac{1}{2}$ inches across; calyx tube of ♂ flower 1 inch or less in length, the narrow teeth or lobes slightly shorter; corolla 1 $\frac{1}{2}$ to nearly 3 inches long; fruit 5-celled, about 3 inches long, nearly globular, the peduncle with thickened ridges.

Native to southern California and possibly adjacent Nevada and Arizona. *C. californica* appears to be but an extreme form with no characters to separate it from the preceding species except the smaller size of its parts.

4. *Cucurbita digitata*. A. Gray, *Pl. Wrightiana* 2:60. 1853.

Perennial trailing vine with slender obtusely angular stems often rooting at the nodes; leaves suborbicular in outline but palmately cleft nearly to the base into 3-5 sublinear segments; leaves green and sparsely hirsute above, ashy green and more or less densely short hirsute below, 5-8 inches across; calyx tube of ♂ flower about

1½ inches long, the subulate teeth less than ½ inch long; corolla 2–3 inches long; fruit 5-celled, nearly globular 2–4 inches in diameter.

Native to Arizona and New Mexico. This is closely allied to the preceding species and differs chiefly in the form of the leaves.

5. *Cucurbita radicans* Naud. *Ann. Sci. Nat. V.* 6:8. 1866. *Sphenantha scabra* Schrad. *Linnaea* 12:416. 1838. (Not *C. scabra* Blume 1823.) "*S. scandens* Schrad" Steud. *Nom. ed. 2.* 2:621. 1841. sphalm.

Perennial long-running vine with rather slender terete hirsute stems; leaves cordate-ovate in outline, rather deeply 3- to 7-lobed, the lobes often acute but the sinus rounded, medium green and rough above sometimes marbled with white, paler and more or less hirsute beneath; calyx tube narrowly campanulate about ⅝ inch long, the lobes narrow subulate ½ inch or less in length, corolla 2¼–2½ inches long, the lobes acute; fruit 3–5 inches long, nearly globular, seeds ¾–½ inch long, half as broad, thin.

Native to Mexico, and thus far of botanical interest only. In appearance it suggests some forms of the yellow flowered gourds, *C. Pepo ovifera*.

6. *Cucurbita ficifolia* Bouche, *Verh. Ver. Gartenb.* Berlin 12:205. 1837. Malabar Gourd. *Pepo malabaricus* Sageret, *Ann. Sci. Nat. I.* 8:312. 1826. *C. melanosperma* Al. Br. (*Cat. Hort. Karls.* 1824. nomen) ex Gaspar. in *Rendic Acad. Sci. Nap.* 6:448. 1847. *Pepo ficifolia* Britton *N. Y. Acad. Sci.* 6:266. 1925.

Perennial long-running vine with stout setose stems becoming somewhat woody; leaves reniform to suborbicular in outline, 7–10 inches across, pinnate to 5-lobate, the sinuses occasionally extending one-half way to the base of the blade, petioles stout, striate; flowers about 3 inches across, calyx tube short and lobes short and slender, corolla broad campanulate with spreading lobes; fruit nearly globular to oblong, 6–12 inches in length, green with white stripes, the peduncle expanded somewhat at point of attachment, seeds black or blackish brown (fuscous), occasionally white, about ¾ inch long.

Widely distributed from Mexico to Chile. The name, Malabar gourd, is a misnomer, as Sageret recognized though he inconsistently called the plant *Pepo malabaricus*. It is native to tropical America but is widely distributed in the Old World. It is noteworthy that the Russian explorers have found white-seeded forms as reported in the publications noted at the beginning of this chapter.

7. *Cucurbita okeechobeensis* Bailey. *Gent. Herb.* 2:179. Oct. 1930. Okeechobee Gourd. *Pepo okeechobeensis* Small, *Journ. N. Y. Bot. Gard.* 31¹²:12:Jan. 1930.

Annual climbing vine, with short hirsute slender stems becoming glabrate; leaves suborbicular to reniform in outline, more or less cordate at base, shallowly 5–7 angle-lobed, green slightly paler and more or less pubescent beneath; flowers whitish or light cream, calyx tube of ♂ flowers campanulate about ½ inch long with narrow lobes less than ¼ inch long; corolla about 3 inches long, the lobes mucronate; fruit nearly globular about 3 inches long, smooth bright green with white or darker green spots.

Native of Florida, a very distinct species described in more detail in the references cited above.

8. *Cucurbita moschata* Duch. in Poir. *Dict. Sci. Nat.* 11:234. 1818. Fall and Winter squashes and pumpkins. *C. Pepo moschata* Duch. in Lam. *Encycl.* 2:152. 1786. *Pepo moschatus* and *P. eximius* Sag. *Ann. Sci. Nat. I.* 8:312. 1826. *Cucurbita spathularis* Schrad. *Linnaea* 12:406. 1838. (fide *Kew Ind.*) *C. macrocarpa* Gasp. *Rendic. Acad. Sci. Nap.* 6:447. 1847. *C. hippopera* Ser. *Fl. Jard. & Cult.* 2:531. 1847. *Gymnopetalum calyculatum* Miq. *Fl. Ind. Bot. Suppl.* 1:332. 1860. *Cucurbita melonaeformis* Carr. *Rev. Hort.* 52. 137. 1880. *C. Pepo* var. *melonaeformis* Mak. *Tokyo Bot. Mag.* 22⁸:47. 1908. *C. mixta*. Pang. *Bull. App. Bot.* 23³:258 & 264. 1930.

Annual long-running vine with stems generally soft hairy especially at the tips; leaves broad-ovate to suborbicular in outline, the lamina decurrent on the basal veins to the point of attachment, usually shallowly lobed and more or less marked with white blotches; flowers large yellow, calyx lobes often expanded foliaceous, corolla lobes broadly spreading, usually neither as acute as those of *C. Pepo* nor so obtuse as those of *C. maxima*; anther column about the same length as the filaments and usually much contorted; fruit various, the peduncle either hard and obtusely ridged somewhat as in *C. Pepo* or fleshy and subcylindrical as in *C. maxima*, often expanded at the point of attachment to the fruit.

Apparently of Central American origin but spreading to both North and South America. The Seminole pumpkins of Florida are true *C. moschata*. *Cucurbita mixta* (which was recently described in Russia from Central American material) falls well into the range of variation shown by cultivated varieties differing only in the woodiness of the fruit shell, though various cultivated varieties become very woody in storage. It may represent more primitive forms. The variety *cyanoperizona* has seeds closely resembling those of the cultivated "Charles Naudin" variety and the variety *stenosperma* seems to be matched by several cultivated forms in the United States. The photographs and drawings published with the description fail to show any characters by which the fruits, flowers, or foliage may be differentiated from the widely varying forms of *C. moschata* as already known. The cultivated forms of importance are treated at length in a succeeding chapter.

9. *Cucurbita Andreana* Naud. *Rev. Hort.* 68:542. 1896.

Annual long-running vine, with striate, bristly stems rooting at the nodes, up to 70–80 feet long; leaves more or less 3-lobed, the central lobe acutish, the blade often marbled with white, the petioles long and setose; flowers monoecious, the calyx with linear acute lobes about half the length of the bright yellow corolla which is up to 3 or 3½ inches long, the lobes acute, pistil and stamens apparently similar to those of *C. moschata*, fruit small, generally from 3–6 inches long, though occasionally larger obovoid, greenish with white longitudinal stripes, flesh bitter, the peduncle ridged and somewhat pentagonal; seeds black or nearly so, numerous, about ¼ inch long or less.

Native of Uruguay and Argentina. Known for many years—in North America at least—only from the original description and a few seedlings raised from the original plant which fruited in France. Archevelata's

description in his *Flora Uruguay* 2:143, 1905, and the discussion by Parodi in his paper on pre-Hispanic agriculture in Argentina,⁹ render this plant of interest as a possible wild type of *C. maxima*. The mottling of leaves is known to us, however, only in *C. Pepo* and *C. moschata*.

10. *Cucurbita Pepo* L. *Sp. Pl.* 1010. 1753. Pumpkin, Summer Squash.—*C. verrucosa* and *C. Melopepo* L. *l. c.* *C. mammeata* Molina, *Sagg. Chili*. 133. 1782. *C. Pepo polymorpha* Duch. in Lam. *Encycl.* 2:152. 1786. *Pepo vulgaris*, *P. verrucosus*, and *P. Melopepo* Moench, *Meth.* 653. 1794. *Cucurbita fastuosa* Salisb. *Prod.* 157. 1796. *C. subverrucosa* Willd. *Sp. Pl.* 4:609. 1805. *C. esculenta* S. F. Gray, *Nat. Arr. Br. Pl.* 2:552. 1821. *C. Courgero* Ser. *Mem. Soc. Hist. Nat. Gen.* 3²:t. 1. 1825. *Pepo Citrullus* Sag. *Ann. Sci. Nat.* I. 9:311. 1826. *Cucurbita venosa* Descourt. *Fl. Antill.* 5:79. 1827. *C. clodiensis* Nacc. *Fl. Ven.* 5:52. 1828. *C. maxima* γ *Courgero* Ser. in D. C. *Prod.* 3:316. 1828. *C. oblonga* Link, *Handb.* 1:643. 1829. *C. pileiformis* Roem. *Syn. Pepon.* 86. 1846.

(*C. asteroides*, *cucumifera*, *elongata*, *tuberculosa* and *urnigera* Schrad. *Ind. Sem. Gott.* and in *Linnaea* 10:12. 1836 and 1838, are names only or names with inadequate descriptions which are generally considered as synonyms of *C. Pepo*. *Cucumis Zapallo* and *Cucurbita radiata* Steud. *Nom. ed.* 2. 452. 1840, are likewise herbarium names usually associated with this species. *Cucurbita succado* Naeg., *C. hybrida* Bertol., and the following garden names, *C. aurantiformis*, *C. bicolor*, *C. bicorporea*, *C. coronata*, *C. marsupiformis*, *C. pyriformis*, *C. stellata*, *C. turbinata* and *C. variegata* are listed by Naudin, *Ann. Sci. Nat.* VI. 6:129. 1856, as also applying here. In addition to the names cited above a large number of Latin names were used by Alefeld. *Landw. Fl.* 1866.)

Annual erect or trailing plants with prickly, or occasionally soft hairy angled or grooved stems; leaves angular lobed or deeply cut, green, occasionally marbled with white and rarely silvered over the entire surface, the lower veins more or less naked near the point of attachment to petiole; flowers bright yellow to orange-yellow, corolla lobes acute; anther column slender, straight and slightly exceeding the length of the filaments; fruit shape various, the peduncle hard and more or less strongly ridged; seeds more or less light buffy or pale tan.

Native to America and highly variable. Numerous attempts have been made to make a botanical classification of the horticultural groups but none are successful because of the intergradation of characters. The small yellow-flowered gourds noted below are fairly distinct; otherwise no criteria are available for the taxonomic segregation of the various groups.

The scallops, patty pans or cumlings are the type of *C. Melopepo* and of the form *clypeiformis*; the crook-necks were classified as the form *torticollis* by Alefeld. Bailey united both these groups under the name var. *condensa* and later amended Alefeld's *C. Pepo Melopepo* to include them. This grouping depends mainly on two characters—the short nodes and consequent bushy type of plant and the edibility of the fruit before maturity. However, there are vining types which reach

their optimum stage of edibility before maturity and the writer has bred long-running types of crooknecks (short-running specimens are not rare); and a long-running scallop is also known. The vegetable marrows were named var. *medullosa* by Alefeld but intergrading types render such segregation valueless taxonomically. Arbitrary horticultural groupings with non-Latin names seem to the writer to be the only reasonable method of segregating these forms. Such a classification is made in a succeeding chapter.

The only distinct group of variants of taxonomic significance seems to be:

10a. *C. Pepo ovifera* Alef. *Landw. Fl.* 224. 1866. Yellow flowered Gourd. *C. ovifera* L. *Mant.* 126. 1767. *C. aurantia* Willd. *Sp. Pl.* 4:609. 1805. *C. pyxidaris* DC. *Fl. Fr.* 3:693. 1815. *Pepo pyridaris* Poir. *Dict. Sci. Nat.* 8:237. 1818. *Cucurbita ceratoceras* Haberle in Spix & Mart. *Reise* 1:536. 1823. *C. pomiformis* Roem. *Syn. Pepon.* 85. 1846. *C. grisea* Roem. *l. c.* 86. *Tristemon texanum* Scheele, *Linnaea* 21:586. 1848. *Cucurbita texana* A. Gray. *Pl. Lindh.* 2:193. 1850.

More slender vines with generally thinner, smaller and less abundant foliage than in the species; fruits small, hard-shelled, bitter and inedible, of various shapes and markings.

The names Apple, Pear, Orange, Nest-egg, Bishop's Mitre, etc., suggest some of the forms and colors that render these fruits attractive and popular ornamentals.

11. *Cucurbita maxima* Duch. in Lam. *Encycl.* 2:151. 1786. Fall and Winter Squashes and Pumpkins. *C. Potiro* Pers. *Syn. Pl.* 2:593. 1807. *Pepo Potiro* Sag. *Ann. Sci. Nat.* I. 8:311. 1826. *Cucurbita maxima* α *Potiro* and β *viridis* Ser. in DC. *Prod.* 3:316. 1828. *Pepo maximus* Peterm. *Fl. Lips. Excurs.* 562. 1838. *P. macrocarpus* Rich. ex Spach. *Veg. Phan.* 6:202. 1838. *Cucurbita Farinae* Mozz. ex Naud. *Ann. Sci. Nat.* IV. 6:17. 1856. *C. maxima sylvestris* Naud. *l. c.* *C. Rapallito* Carr. *Rev. Hort.* (1872) 399. 1873. *Cucumis Rapallito* Carr. *l. c.*

Annual generally long-running but occasionally short-running vines (rarely bushy plants), with slightly ridged or striate stems somewhat bristly-hirsute or sparingly setaceous; leaves green, orbicular or nearly so, usually sinuate-margined (rarely lobed, the lobes then rounded or very obtuse); margins soft mucronate, the basal veins naked for an inch or more from point of attachment to petiole; flowers light to deep yellow; calyx lobes short and narrow; corolla lobes usually somewhat reflexed, crenate-sinuate, very obtuse, anther column obtuse, much longer than filaments, slightly contorted; fruits top-shaped, globular, oblong, or flattened cylindrical, not heavily ridged; fruit stalk more or less spongy and cylindrical; seeds usually clear white or fawn-colored, apex ordinarily oblique.

Native of South America and possibly derived from a form similar to *C. Andreana*. While this species is not as variable as *C. Pepo*, there are several horticultural groups; and one, the following, which possibly merits taxonomic status.

⁹ See *Anales de la Academia Nacional de Agronomía y Veterinaria de Buenos Aires*. 1:142. 1935.

11a. *C. maxima turbaniformis* Alef. *Landw. Fl.* 212. 1866. Turban Squashes. *C. turbaniformis* Roem. *Syn. Pepon.* 87. 1846. *Pileocalyx elegans* Gaspar. *Rendic. Acad. Sci. Nap.* 6:409. 1847.

Fruit often 5-celled and with projecting portion known as the "Acorn." It may be questioned whether this form merits a botanical designation in view of the fact that a somewhat similarly formed fruit occurs among the yellow-flowered gourds, *C. Pepo ovifera*.

Certainly the writer would object to proposing a new name but inasmuch as these turban forms have recently been again accorded specific rank by Pangolo and since there seem to be few intermediate forms known at present between the turbans and the other maximas, it may well stand as a subordinate group of the species under a name already well known.

The horticultural varieties are considered in detail in a succeeding chapter.

CHAPTER III

SQUASHES AND PUMPKINS

Although several earlier writers referred to a few varieties of *Cucurbita*, the first comprehensive publication dealing with a discussion of varieties was the "Description des Plantes Potageres" by Vilmorin-Andrieux et Cie, in 1856. This was revised once in 1883 and again in 1909, in neither edition of which was there any classification used. In 1863 Fearing Burr, Jr., published his "Field and Garden Vegetables of America," which was almost entirely devoted to the discussion of varieties. It was not until 1887, however, that the first and only horticultural classification based on plant characters of the varieties of *Cucurbita maxima*, *C. Pepo*, and *C. moschata* was made. This materialized after several years trials by Sturtevant and Goff, early investigators at this Station. In their work the bases for separation were leaf shape, degree of stem grooving and expansion at the base, and fruit shape. During the first 30 years in the development of the Agricultural Experiment Stations, a portion of the time was devoted to variety trials of vegetables; and, as a result, a great many brief and tabulated accounts of variety trials were included in the publications issued from the various stations. In 1927 Castetter and Erwin (33) grouped all varieties grown in the United States as either pumpkins or squashes. Pumpkins, in their arrangement, included the varieties of *Cucurbita Pepo* and *C. moschata*, each of which was further divided into horticultural type groups, namely, Connecticut Field, Cheese, Cushaw, Fordhook, Patty Pan, Crookneck and Vegetable Marrow; while the squashes included all varieties of *C. maxima* which were similarly assigned as belonging to Banana, Hubbard, Turban or Mammoth groups. Except for an account of Australian varieties written by Darragh in 1932, the foregoing brief review covers the important literature relating to varieties of *Cucurbita*.

CUCURBITA MAXIMA

The indiscriminate use of the words squash and pumpkin by early authors as well as the more modern writers, as noted in the first chapter, has resulted in considerable confusion to horticulturists. Not only has this situation been a source of misunderstanding to present day gardeners and seedsmen but to the historians and early explorers, the latter often having used names which could have been applied to melons, cucumbers, gourds, or the three economic species of *Cucurbita*. At the present time squash is a name applied to certain varieties of all three species but more specifically to most varieties of *C. maxima* and the summer and early fall varieties of *C. Pepo*. Pumpkin is used to denote the long keeping varieties of *C. Pepo*, most varieties of *C. moschata* and an occasional sort of *C. maxima*.

The use of these terms is in many cases exactly reversed in other areas.

Of the three species to be discussed in this chapter, *Cucurbita maxima* represents the most modern introduction in the history of our agriculture, since the earliest records concern *C. Pepo* and *C. moschata*. The varieties of *C. maxima* are now believed to have originated in South America, probably Peru or Chili. The first authentic reports of this sort among our early colonists are those of Acorn, probably a turban sort, listed by Russell in 1827, and Valparaiso, listed by Thorburn in 1828. Although there is some evidence to indicate the existence of the forerunner of Hubbard in 1798 in Marblehead, Massachusetts, the several versions of Hubbard's origin render this theory somewhat dubious. About 1830 two other types, the French Turban and the Autumnal Marrow, were known to have existed; and shortly afterwards the Mammoth and a sort called Cocoa-nut were known. About 1842, the squash which was later to be known as the Hubbard was brought to the attention of James J. H. Gregory, a prominent and successful market gardener of Marblehead, Massachusetts, and it was due to the public interest in this variety that Mr. Gregory embarked upon the career of a seedsman, a vocation for which he has long been known. The period from 1860 to 1880 saw little increase in new varieties, although at this time Marblehead and American Turban were introduced. From 1880 to 1890 the greatest activity in the introduction of new winter squash varieties was recorded when some 20 distinct sorts were brought forth. Many of these fell by the wayside before 1910, after which such varieties as Blue Hubbard, Quality, Golden Delicious, Buttercup and Brighton were developed.

The nature and use of the varieties in this group is exceedingly diverse. The fruits range in size from the very small Buttercup to the enormous Mammoth, and likewise exhibit similar diversity in plant growth, as exemplified by the bush-like nature of the Tree squash in comparison to the exceedingly vigorous 25 to 30 foot runners produced by Queensland Blue and others of the Australian group. The maximas include varieties adapted for different uses. Hubbard and Delicious represent the group especially good for baking, Boston Marrow, Golden Delicious and Etampes for the manufacture of pie stock, while Mammoth is considered best for stock food and exhibition purposes.

Fifty-two distinct sorts are to be discussed in this publication. A great many more names are included, most of which are either synonyms or names of obscure varieties about which available information is exceedingly meager. For the most part, varieties of other countries are not treated other than to cite references which include a discussion of them.

Alligator. Refs. 33, 40, 41, 129. Syn. New Alligator.

A sport from Banana, this elongated winter squash was named and introduced by S. M. Isbell & Co. in 1926. The first selection was made in 1923 by a grower in Jackson County, Michigan.

The fruits of this variety resemble to some extent those of Winnebago. They are long and comparatively slender, 18-24 x 5-7 inches, weigh 15-18 pounds, and are nearly cylindrical, tapering somewhat at both ends. The skin is very dark green (dull greenish black), the surface rough, bumpy, and somewhat corrugated, and the flesh is hard, firm, has a fine texture, is moderately dry and is deep yellow in color.

American Turban. Refs. 7, 11, 14, 37, 41, 48, 50, 54, 59, 64, 73, 89, 100, 101, 128, 129, 130, 132, 134, 137. Syns. Bishops Head, Turks Cap.

The American Turban when introduced about 1869 was said to have come from a combination of Hubbard, Autumnal Marrow, Acorn and French Turban. The shape and color of the fruits indicate that it probably came from a cross between French Turban and Autumnal Marrow. This variety became one of the leading sorts of the last century but of late years other varieties have replaced it.

Apparently the chief difference between this and Essex Hybrid was in color of the skin, that of American Turban being distinctly more salmon tinted.

Plant trailing; vines, foliage and flowers much the same as those of Essex Hybrid.

Fruit small; 6-7 x 9-10 inches; weight 9-10 pounds. Shape drum-like, flattened at base and apex; surface moderately smooth, slightly uneven and bumpy; acorn, 4-5 inches in diameter, slightly protuberant. Skin color dull salmon orange (ochraceous salmon) with the blossom scar or acorn variously colored with pink, pale greenish blue and orange. Shell hard and medium thick, $\frac{1}{8}$ inch. Flesh thick at the base, $1\frac{1}{2}$ inches, gradually thinner towards the apex, orange color; texture moderately fine, rather moist, tender.

Arikara. Refs. 33, 41, 73.

Dr. Melvin R. Gilmore, Museum of Anthropology, University of Michigan, found this squash under cultivation by the Indians in North Dakota. The variety is unique because at the time of its discovery it was apparently the only maxima grown by the Arikaras on the Ft. Berthold reservation. It was given the tribal name Arikara by Oscar H. Will & Co., of Bismarck, North Dakota, at the time of its introduction in 1920. This squash may well be considered a member of the Hubbard group in both shape and keeping qualities. Because of its performance when grown under drouth conditions, it is of great value to the Northern Plains region.

Mature fruits were produced at Geneva in 110 days, which was 5 days earlier than Hubbard, in season with Kitchenette and Golden Hubbard and 10 days later than Boston Marrow. The vines are considerably less vigorous than those of the Hubbard with the flowers larger and more deeply cut between the petals. The fruits are smaller, somewhat similar in shape, but lack the curvature at the base and apex of the Hubbard variety.

Plant trailing; vines slender, moderately weak, 7-8 feet; branches few, basal. Cotyledons long and broad, $3\frac{1}{2}$ x $2\frac{1}{4}$ inches; long oval; apex tapered; color medium green. Leaves small, 9 x 13 inches; moderately lobed; sinuses narrow, somewhat acute at the base; margin slightly serrated near the base, otherwise denticulate, distinctly frilled; surface smooth; color medium green. Flower—pistillate, moderately large, $6\frac{1}{2}$ inches across; corolla yellow, deeply cut with margins moderately frilled; ovary fusiform; stigma lemon yellow; sepals very short and slender, $\frac{3}{8}$ inch;—staminate, medium size, 5 inches across; sepals moderately short and very slender, $\frac{3}{4}$ inch; pedicle short, 6-7 inches.

Fruit small, 9-10 x 8-9 inches; weight 6-8 pounds. Shape abruptly tapered fusiform with the medial nearly globular; ribbed widely; furrows shallow; surface shallowly wrinkled and ridged, occasionally somewhat pock-marked; blossom scar with button $\frac{1}{4}$ inch long. Skin color pale salmon pink (light ochraceous salmon to salmon buff) with the extreme apex irregularly streaked for $1-1\frac{1}{2}$ inches toward the medial with pale bluish green (graphalium green to olive gray); other areas occasionally blotched similarly. Fruit stalk moderately short, $2-2\frac{1}{2}$ inches, round, slightly curved, rough and corky. Shell hard and thin, $\frac{1}{8}$ inch. Flesh moderately thin, $\frac{3}{4}$ -1 inch, thickest at base; texture moderately fine, tender, moderately moist and soft; flavor lacking, faintly sweet; quality poor; color deep yellow (deep chrome), often variable within the same specimen. Seed cavity large, contains much placental tissue which is moist, stringy, often chunky, tender and easily removed.

Seed medium large, medium long and broad, medium plump, 1.9 x 1.2 x .33 cm. (88 per oz.); face wrinkled, glossy white; margin rounded, smooth.

Atlas. Refs. 33, 41, 73, 129, 130. Syn. New Atlas.

The Atlas is a selection from Mammoth Chile introduced by the Iowa Seed Co. in 1898. Since it was never grown at Geneva, information concerning it has very largely been secured from Castetter and Erwin.

Fruit large, 21 x 13 inches; weight 35 pounds. Shape variable, usually ovate, ribbed broadly; furrowed rather shallow; surface smooth, skin color glossy, reddish yellow. Shell soft; flesh coarse, moist, slightly sweet, dull yellow; quality fair.

Banana. Refs. 14, 33, 41, 73, 122, 129, 130. Syns. Mexican Banana, Plymouth Rock.

Banana was first offered by several seed houses about 1893 but the variety never became a leading sort at least on eastern markets. It was first listed as Mexican Banana and is occasionally so listed today. The original stock often showed some slight striping of a light orange tinge. H. L. Musser of Aggeler & Musser Co., Los Angeles, California, made selection to separate the darker blue or gray type and the yellow and orange pink fruits. Both the blue or gray Banana and Pink Banana are now listed by some Pacific Coast seedsmen where this variety is of commercial importance.

One hundred and twenty-five days were required to mature fruits of this variety at Geneva. This was in season with Essex Hybrid and Victor and five days later than Mammoth Whale and Winnebago. The vines are about as vigorous as those of Hubbard and slightly less vigorous than those of Mammoth Whale. The flowers are decidedly less velvety, less pubescent and with margins less curved than those of Mammoth Whale. The fruits are similar in shape to those of Winnebago but are smoother and lighter in color.

Plant trailing; vines moderately coarse, moderately vigorous, 12-15 feet long; extreme basal portion very dark green, remainder moderately light green; branches moderately many, basal. Coty-



BANANA

(One-half natural size)



BOSTON MARROW

(Two-thirds natural size)

ledons moderately long and broad, $2\frac{3}{4} \times 2$ inches; short oval to nearly round; apex tapered. Leaves nearly entire, small, 9×13 inches; margin slightly serrate near the base, otherwise denticulate, slightly frilled; color dull medium green; petiole moderately long, 15-18 inches and moderately slender. Flower — pistillate, medium size, $5\frac{1}{2}$ –6 inches across, pale orange yellow; ovary nearly cylindrical; sepals short and very slender, $1-1\frac{1}{4}$ inches; —staminate moderately small, $4-4\frac{1}{2}$ inches across; sepals short and very slender, $\frac{3}{4}$ – $\frac{7}{8}$ inch.

Fruit large, 18–20 x 5–6 inches; weight 10–12 pounds. Shape nearly cylindrical and moderately tapering at base and apex; surface moderately smooth to obscurely wrinkled and pock-marked. Blossom scar with button prominent, $\frac{1}{2}$ – $\frac{3}{4}$ inch long. Skin color gray (court gray to pale olive gray), changing to creamy pink (pale ochraceous buff) in storage. Fruit stalk moderately short, 1–2 inches, round, straight, soft and corky. Shell medium hardness, $\frac{1}{8}$ – $\frac{3}{16}$ inch thick. Flesh medium thickness, $1-1\frac{1}{4}$ inches, slightly thicker at the base and apex; texture very fine, moderately dry, tender; quality moderately good; color orange yellow (light orange yellow to orange buff). Seed cavity large, conforms to general shape of the fruit, contains much placental tissue which is slightly stringy but easily removed.

Seed medium large, medium length and width, plump, $1.8 \times 1.0 \times .44$ cm. (144 per oz.); face smooth, brown (dark fawn); margin slightly ridged, corky (cream buff) in color.

Bay State. Refs. 14, 23, 27, 31, 33, 38, 41, 47, 50, 51, 59, 61, 64, 73, 98, 99, 118, 129, 130, 135. Syn. Improved Bay State.

This variety similar in shape to Essex Hybrid was introduced by Aaron Low, seedsman, in 1888. A single plant bearing turban-shaped squashes of a slate gray instead of the usual orange was found by Mr. Low and the strain perpetuated by selection. It is quite possible that this odd plant found in a field of Essex Hybrid was only a different form from the original chance cross that produced the Essex.

Bay State required 115 days to reach maturity at Geneva. This was 10 days earlier than Essex Hybrid and Victor and in season with Hubbard and Marblehead. The vines are more vigorous than those of Essex Hybrid, and the pistillate flowers have more greenish yellow ovaries and longer and heavier sepals. The fruits are smaller, but similar in shape to Essex Hybrid, with a somewhat less prominent blossom scar.

Plant trailing; vines moderately heavy, vigorous, 15–18 feet long; branches many, basal. Cotyledons medium long and moderately broad, $2\frac{3}{4} \times 2$ inches; oval; apex moderately rounded; medium green color. Leaves very shallowly lobed, moderately small, 9×14 inches; margin denticulate, moderately frilled; surface moderately smooth; color medium green; petiole medium long and medium slender, 14–16 inches. Flower — pistillate, medium size, $5-5\frac{1}{2}$ inches across, yellow; ovary drum-like; sepals medium long and moderately slender, $1-1\frac{1}{4}$ inches; —staminate, moderately small, $4-4\frac{1}{2}$ inches across; stigma twisted and irregular, distinctly expanded; sepals moderately short and moderately slender, 1 inch; pedicel short, 5–7 inches.

Fruit small, 7–8 x 10–12 inches; weight 10–12 pounds. Shape drum-like, flattened at the base, distinctly depressed at the apex, often slightly constricted at the medial; ribbed narrowly; furrows shallow; surface moderately smooth and occasionally somewhat uneven; acorn very prominent, 2–3 inches in diameter, pale yellow (margarite yellow) in color. Skin color bluish gray (tea green to deep olive gray). Fruit stalk medium long, 3–4 inches, round, curved, spongy and corky. Shell very hard, woody, moderately thick, $\frac{1}{8}$ – $\frac{1}{16}$ inch. Flesh thickest at the base, $1\frac{1}{4}$ – $1\frac{3}{4}$ inches; at the medial, 1 inch; at apex $\frac{1}{2}$ inch; texture moderately fine, medium dry; fair flavor and sweetness; quality fair; color dull yellow to light

orange (light cadmium to light orange yellow). Seed cavity medium size, near center and towards apex; placental tissue moderately abundant, stringy, rather difficult to remove.

Seed medium large; medium length and width, moderately plump, $1.88 \times 1.07 \times .36$ cm. (108 per oz.); face wrinkled, glossy white; margin rounded, smooth.

Blue Hubbard. Refs. 33, 41, 73, 129, 130. Syn. Symmes Blue Hubbard.

Of comparatively recent introduction, this variety has slowly forged ahead in the esteem of gardeners all over the country. It now has reached the position which was predicted for it when Mr. Gregory said in 1909, the year of its introduction, "Our ninth introduction, all things considered, is our best." It was named originally, Symmes Blue Hubbard, for S. S. Symmes, a gardener and florist of Cliftondale, Massachusetts, who for many years had grown seeds for the Gregory concern. It retains many of the Hubbard characteristics and probably was a hybrid between that variety and either Middleton Blue or Marblehead. Since its introduction there have been several changes in the accepted type but the description given below seems to be that represented by leading growers in Massachusetts.

Mature fruits were obtained at Geneva in 120 days, 5 days later than Hubbard, in season with Chicago Warted Hubbard and 5 days earlier than Essex Hybrid. The plants are more vigorous than those of Hubbard and have larger leaves which are distinctly more silvery green in color. The fruits are larger, longer, more heavily and deeply corrugated and have a distinctly thicker neck at the base.

Plant trailing; vines moderately coarse, vigorous, 15–18 feet long; branches many, basal and medial. Cotyledons moderately long and broad, 3×2 inches; oval; apex tapered; veining moderately prominent; color grayish green. Leaves very shallowly lobed, medium large, 10×16 inches; margin slightly serrated near the base, otherwise denticulate, frilled; surface moderately smooth; color moderately dark green, usually having a pale silvery sheen; petiole medium long and moderately heavy, 14–16 inches. Flower — pistillate, moderately large, $6\frac{1}{2}$ inches across, yellow, ovary fusiform, slightly curved and moderately fuzzy; sepals short, slender, $\frac{1}{2}$ – $\frac{3}{4}$ inch; —staminate, medium large, $5-5\frac{1}{2}$ inches across, sepals medium long and moderately slender, $1-1\frac{1}{4}$ inches; pedicel medium long, 8–9 inches.

Fruit medium to moderately large, 15–18 x 9–12 inches; weight 12–18 pounds. Shape thick falcate-fusiform, moderately tapering towards the base into a thick neck. The long type carries the thickness over a greater length, the central portion being more oval than globular; ribbed irregularly; furrows narrow; surface wrinkled, warted, often corrugated. Blossom scar with button present, $\frac{1}{4}$ – $\frac{1}{2}$ inch long. Skin color blue gray (court gray); during late storage this is replaced by pale pink (pale pinkish buff). Fruit stalk moderately short, $2\frac{1}{2}$ –3 inches, round, slightly curved, rough and corky. Shell very hard, woody and thick, $\frac{1}{4}$ inch, pale green (lime green) in color. Flesh moderately thick at the medial, $1\frac{1}{4}$ – $1\frac{1}{2}$ inches, thick at the apex, $1\frac{3}{4}$ inches, and solid at the base, often 3–4 inches; texture fine, medium dry, moderately tender; somewhat astringent, moderately sweet, good flavor; quality good; color dull orange (orange buff). Seed cavity large, contains a moderate amount of placental tissue, which is moderately dry, rather stringy, and easily removed.

Seed medium long; medium large and broad, plump, $1.93 \times 1.24 \times .46$ cm. (88 per oz.); face wrinkled, glossy white; margin rounded, smooth.

Boston Marrow. Refs. 1, 14, 20, 21, 23, 24, 26, 27, 28, 30, 31, 33, 34, 37, 38, 41, 43, 44, 46, 47, 48, 50, 51, 52, 54, 56, 58, 59, 60, 61, 64, 65, 67, 72, 73, 77, 78, 96, 98, 99, 101, 102, 105, 108, 115, 116, 117, 119, 121, 125, 129, 130, 132, 135, 136. Syns. Autumnal Boston Marrow, Autumnal Marrow, Boston Vegetable Marrow, Cambridge Marrow, Chicago Marrow, Chicago Orange Marrow, Colvin's Orange Marrow, Dunlap Early Prolific Marrow, Early Marrow, Early Orange Marrow, Early Prolific Marrow, Early Prolific Orange Marrow, Extra Early Marrow, Extra Early Orange Marrow, Extra Early Prolific Marrow, Extra Early Prolific Orange Marrow, Golden West Hard Shell, Improved Boston Marrow, Improved Marrow, Improved Orange Marrow, Improved Prolific Marrow, Improved Prolific Orange Marrow, Large Boston Marrow, Marrow, Metcalf, Orange, Orange Marrow, Prolific Marrow, Prolific Orange Marrow.

For over a hundred years the Autumnal or Boston Marrow, or one of the many strains selected from it, has been grown as the standard early squash. As the first of the early varieties to be ready for market it has been one of the most widely grown of all sorts. Mr. J. M. Ives of Salem, Massachusetts, in a letter published by Fearing Burr, Jr., in his work on Field and Garden Vegetables, acknowledges the gift of a specimen in 1831 from a friend in Northampton, Massachusetts, who in turn had received the seeds from Buffalo, New York. A tribe of Indians who visited Buffalo in the spring of each year had, so the story goes, furnished seed to Buffalo gardeners. Here the trail ends.

Of this variety, Gregory, writing in the New England Farmer, says: "If this squash originated among our Indians as this statement might lead us to infer, it is too much to suppose that with its splendid appearance and the many excellent qualities it possessed when first introduced it should have been unknown to the whites to so late a day." This also falls in with the view of T. W. Harris (65) who tried to find evidence that the Autumnal Marrow of Ives could be traced back to either Commodore Porter's Valparaiso squash and therefore to Chilean origin or to the "*C. mammeata*" described as native of Chili by Molena in 1782.

From 1831, the year this was first introduced, until 1920, when Oscar H. Will of Bismarck, North Dakota, introduced several varieties as coming from an Indian origin, we have a period of nearly 100 years. Yet during this entire period if we are to rely on published records we have no other varieties of *C. maxima* mentioned as coming from a source traceable to the Indians.

There have been many strains of this offered, such as Cambridge Marrow, Prolific Marrow, Dunlap Marrow, Chicago Orange Marrow. While it was thought that some of these were of hybrid origin most were probably selections or sports. The factor of color seems to have attracted attention. This has been true with all of the yellow squash, for apparently the ideal has been to select the darker specimens and to work toward a bright

orange color skin. Descriptions of the variety as grown when first introduced picture it as a variety weighing from 5 to 6 pounds, smaller than the type now grown. Leading seedsmen of the past generation referred to this squash as the true pie squash, and apparently preferred it to the drier varieties.

This variety is one of the earliest winter squashes, having reached maturity at Geneva in 100 days, 10 days earlier than Golden Hubbard and in season with Quality. The vines of Boston Marrow and Golden Hubbard are very similar, although the pistillate flowers of the former are larger and have a turbinate ovary instead of fusiform one. The fruits of Boston Marrow are more flattened at the apex, not curved, and lack the grayish green blotch near the fleshy style common to Golden Hubbard.

Plant trailing; vines coarse, moderately vigorous, 12-15 feet long; branches few, basal. Cotyledons moderately long and broad, $3\frac{3}{8} \times 2\frac{1}{4}$ inches; long oval; apex tapered; veining moderately prominent; color moderately light green. Leaves shallowly lobed, small, 9 x 12 inches, margin slightly serrate near the base, otherwise denticulate; surface moderately smooth; color moderately dark green; petiole moderately short and moderately slender, 12-14 inches. Flower—pistillate, moderately large, 6 inches across, pale yellow; ovary somewhat turbinate, abruptly tapered towards apex, slightly tapered towards base; sepals moderately short and moderately slender, $\frac{3}{4}$ inch;—staminate, medium size, $5\frac{1}{2}$ inches across; sepals moderately short and moderately heavy at the base, $\frac{3}{4}$ inch; pedicel short, 5-6 inches.

Fruit moderately small, 12-14 x 10-11 inches; weight 12-16 pounds. Shape medial nearly globular, tapering very abruptly to the apex which is often nearly flattened, and gradually tapering towards the base; ribbed widely; furrows shallow; surface wrinkled and distinctly pock-marked. Blossom scar with button present, $\frac{1}{4}$ - $\frac{1}{2}$ inch long. Skin color orange (apricot orange to rufus) regularly laced with an orange buff (light ochraceous salmon) color pattern. Fruit stalk medium long, 3-4 inches, round, slightly curved, corky, soft. Shell moderately soft and medium thick $\frac{1}{8}$ inch. Flesh thickest at the base, 2-2 $\frac{1}{2}$ inches, medial and apical 1-1 $\frac{1}{2}$ inches; texture moderately fine, moderately moist, tender; fair flavor and sweetness; quality fair; color orange yellow (deep chrome to orange buff). Seed cavity large, has much placental tissue which is moist, tender, and easily removed.

Seed moderately large; moderately long and moderately narrow; medium plump, 2.15 x 1.24 x .34 cm. (108 per oz.); face wrinkled, glossy white; margin rounded, smooth.

Brighton. Syn. New Brighton.

In 1914 Richard Wellington self pollinated a number of plants of Hubbard squash at the Minnesota College of Agriculture at St. Paul. Some 23 inbred lines which could be separated according to size, shape, and color were isolated. These lines were carried along and continued selfings made. In 1921 a small fruited type was introduced as Kitchenette. The demand for a larger fruited strain persisted and in 1932 the largest of these was named New Brighton and introduced from the Minnesota College of Agriculture and later by the C. J. Lindholm Seed Co. of Minneapolis.

Brighton attained maturity at Geneva in 120 days, 5 days earlier than Banana, in season with Blue Hubbard and Chicago Warty Hubbard and 5 days later than Hubbard. The vines are more vigorous than those of Hubbard, have leaves more glossy green, distinctly more crumpled and blistered, with auricles more ascending,

and have considerably larger and more prominently veined flowers. The fruits are much larger, slightly rougher and have flesh which is much lighter yellow in color.

Plant trailing; vines moderately coarse, vigorous, 15-18 feet. Cotyledons moderately short and moderately broad, $2\frac{3}{4} \times 1\frac{3}{4}$ inches; short oval; apex moderately rounded; veining prominent; color distinctly grayish green. Leaves moderately small, 9 x 15 inches, very shallowly lobed; margin slightly serrated at the base, otherwise denticulate; surface moderately crumpled to somewhat blistered; auricles distinctly ascending, vertically parallel to each other, giving the leaves a definite cone-like appearance; color moderately dark glossy green, occasionally very slightly marked with a silvery sheen; petiole short and heavy, 9-12 inches. Flower—pistillate, large, 7 inches across, pale orange; ovary fusiform, slightly fuzzy; sepals moderately short and medium slender, $\frac{3}{4}$ -1 inch;—staminate, medium large, $5\frac{1}{2}$ inches across, veins of the corolla decidedly dark green and prominent; sepals medium long and medium heavy, 1-1 $\frac{1}{2}$ inches, very dark green; pedicle very short, 4-5 inches.

Fruit large, 16-20 x 12-14 inches; weight 28-32 pounds. Shape irregularly fusiform, often moderately constricted at the neck; ribbed moderately narrow and irregular; furrows moderately shallow; surface rather bumpy and uneven. Blossom scar with button prominent, $\frac{3}{4}$ -1 inch. Skin color dull bronzy green (dark grayish olive) marked with narrow pale grayish green (pea green) streaks which radiate from the apex $\frac{1}{4}$ - $\frac{1}{3}$ length of fruit. Fruit stalk medium long, 3-4 inches, very thick, straight, rough and corky. Shell hard and very thick, $\frac{1}{4}$ - $\frac{3}{8}$ inch, often $\frac{1}{2}$ inch in some places. Flesh thick at the medial 1 $\frac{1}{2}$ -2 inches, very thick at the apex, 2 inches, and solid at the base, often 4 $\frac{1}{2}$ -5 inches; texture moderately fine, moderately firm, slightly moist, somewhat stringy, fair flavor, slightly sweet; quality fair; color bright yellow (primuline yellow). Seed cavity large, placental tissue moderately abundant, slightly moist, stringy and easily removed.

Seed moderately large; moderately long, narrow and plump, 2.25 x 1.17 x .43 cm. (88 per oz.); face wrinkled, glossy white; margin rounded and smooth.

Butman. Refs. 9, 14, 26, 50, 59, 61, 64, 98, 109, 110, 119, 128, 130, 132, 134.

The Butman, introduced in 1875 by James J. H. Gregory, Marblehead, Massachusetts, was named for its originator, Clarendon Butman of Maine. It was said to have resulted from a cross between Hubbard and Yokahoma but in view of the fact that crosses between the species *C. maxima* and *C. moschata* are difficult to attain this crossing may not have occurred.

This variety closely resembled Hubbard, being somewhat later in season and smaller fruited but more prolific. The fruits were less curved at the ends, brighter green, had more white markings, had lighter but more uniform flesh color and apparently was equal to the Hubbard in quality.

Plant trailing; vines vigorous, very dark green at the nodes; branches many. Leaves large, very shallowly lobed; petioles streaked with pale green.

Fruit small; 10-12 x 6-8 inches; weight 8-10 pounds. Shape fusiform; ribbed obscurely; furrows shallow; surface somewhat uneven, very slightly bumpy. Skin color bright grass green, blotched and streaked with pale creamy white. Shell hard and moderately thick. Flesh moderately thick; fine texture, dry, sweet, light salmon in color, lemon yellow when cooked; quality good.

Buttercup. Refs. 138, 139.

This, a newcomer to the list of squash, was developed to take the place of the sweet potato in the gardens of North Dakota and the Northern Plains region. In the trial garden at North Dakota Agricultural

Experiment Station during the 1925 season a plant appeared in a row of Quality which produced fruits of desirable appearance. The fruits were included in the baking test given for all varieties and proved to be extraordinarily high in quality. This plant came from seed selected from a Quality plant which had been in a mixed variety planting the previous year. Seed saved from the 1925 selection indicated that a chance cross between Quality and Essex Hybrid had taken place.

Fruits were selfed on the most promising plants and these subjected to a baking test for quality. In 1931, after three years' selection, the most promising strain was released and named Buttercup. The quality testing work was carried out by Miss E. Latzke of the Department of Home Economics of the North Dakota College of Agriculture and the selfing and plant selection work was done under the direction of Professor A. F. Yeager. Oscar H. Will & Co. of Bismarck, North Dakota, introduced Buttercup in their 1931 catalog.

At Geneva mature fruits were produced in 105 days, 10 days earlier than Bay State, in season with Golden Delicious and 5 days later than Quality. The vines are much less vigorous than those of Quality and Bay State and bear pistillate flowers which are smaller and less ruffled than those of Quality with an oblate ovary instead of a turbinate one. The fruits are smaller than those of Quality, similar in skin color, but possess a much more prominent blossom end scar, similar to that of Bay State.

Plant trailing; vines slender, moderately vigorous, 10-12 feet; branches few, basal. Cotyledons medium long and moderately broad, $2\frac{3}{4} \times 1\frac{3}{4}$ inches, long oval; apex moderately tapered; color medium green. Leaves very shallowly lobed, small, 8 x 12 inches; margin denticulate, slightly frilled; surface occasionally somewhat blistered; color moderately dark green; petiole short and moderately slender, 10-12 inches. Flower—pistillate, moderately small, 4-4 $\frac{1}{2}$ inches across, yellow; ovary drum-like; sepals short and moderately slender, $\frac{5}{8}$ - $\frac{3}{4}$ inch;—staminate, moderately small, 4 inches across; stigma decidedly expanded; sepals medium long and moderately heavy, 1-1 $\frac{1}{4}$ inches; pedicle very short, 4-5 inches.

Fruit very small, 4-5 x 6-8 inches; weight 3-5 pounds. Shape somewhat drum-like, sides slightly tapering before leveling off at the apex; base full, slightly rounded; ribbed broadly, furrows shallow; surface moderately smooth, indistinctly pock-marked. Acorn very prominent, usually somewhat protuberant, 2-3 inches in diameter and gray (light mineral gray) in color. Skin color dull dark green (dark ivy green to dull blackish green) spotted with grayish (storm gray to light mineral gray) pock-marks. Fruit stalk moderately short, 2 $\frac{1}{2}$ -3 inches, round, curved, rough and corky. Shell moderately hard and thin, $\frac{1}{16}$ inch. Flesh moderately thick, 1-1 $\frac{1}{2}$ inches at the base and medial, considerably thinner at the apex; texture very fine, tender, dry; sweet and excellent flavor; quality excellent; color orange (cadmium yellow to deep chrome). Seed cavity small, towards apex, containing much placental tissue which is often chunky and rather difficult to remove.

Seed medium large; medium long, narrow and moderately plump, 1.90 x .86 x .38 cm. (140 per oz.); face wrinkled, glossy white; margin rounded, smooth

Chicago Warted Hubbard. Refs. 33, 38, 41, 45, 47, 61, 64, 73, 101, 129, 130. Syns. Green Warted Hubbard, Hard Shell Warty Hubbard, Large Warted Hubbard, Mammoth Warted Hubbard, New Mammoth Hubbard, Toledo Warted Hubbard, Warted Hubbard.

The Warted Hubbard was developed by the Budlong Gardens of Chicago from the original Hubbard and after several years trial was introduced in 1894 by Vaughan's Seed Store of Chicago.

Maturity was attained in 120 days at Geneva, 5 days earlier than Banana and Victor, in season with Blue Hubbard and 5 days later than the regular Hubbard. The vines are more vigorous than those of Hubbard and have pistillate flowers which are considerably larger. The fruits are thicker, decidedly more heavily warted and have flesh which is darker and more uniform in color.

Plant trailing; vines medium coarse, vigorous, 15-18 feet; branches moderately many, basal and occasionally medial. Cotyledons moderately long and broad, 3 x 2 inches, oval; apex moderately rounded; color medium green. Leaves very shallowly lobed, medium large, 10 x 16 inches; margin denticulate, moderately frilled; surface moderately smooth, occasionally somewhat crumpled; color medium green; petiole long and medium heavy, 18-20 inches; flower—pistillate, large, 7 inches across, lemon yellow; ovary somewhat fusiform, slightly tapering at both ends, enlarged at the medial; sepals moderately short and very slender, $\frac{7}{8}$ inch;—staminate, medium large, 5 $\frac{1}{2}$ inches across; sepals medium long and moderately slender, 1-1 $\frac{1}{4}$ inches; pedicel moderately short, 7-8 inches.

Fruit medium large, 12-14 x 10-12 inches; weight 12-15 pounds. Shape thick falcate-fusiform; ribbed irregularly; furrows deep; surface heavily and deeply wrinkled and warted; blossom scar with button $\frac{3}{4}$ -1 inch. Skin color deep dull green (dusky olive green) marked with narrow, pale green (pea green) stripes which radiate from the apex, $\frac{1}{4}$ to $\frac{1}{3}$ the length of the fruit, often obscure. Fruit stalk short, 2 $\frac{1}{2}$ -3 inches, round, slightly curved, rough and corky. Shell very hard, woody and thick to very thick, $\frac{1}{4}$ - $\frac{3}{8}$ inch. Flesh medium thick at the medial, 1-1 $\frac{1}{4}$ inches, thick at the apex, 2-2 $\frac{1}{2}$ inches, and very thick at the base, usually solid flesh, 3 inches or more; texture very fine, dry, tender, crisp, occasionally somewhat lumpy; moderately sweet and well flavored; quality very good; color deep yellow (deep chrome). Seed cavity moderately large, contains much placental tissue, rather stringy, moderately easy to remove.

Seed moderately large; moderately long and narrow, moderately plump, 2.12 x 1.12 x .42 cm. (104 per oz.); face wrinkled, glossy white; margin rounded, smooth.

Cocoa-Nut. Refs. 24, 56. Syn. Cocoa.

This is a variety which was often confused with Valparaiso because of the number of varied colored strains grown under that name. A specimen of Cocoa was shown at a Massachusetts Horticultural Society exhibit in 1856 by E. M. Richards of Dedham, Massachusetts, and was listed by Breck in 1838 and by Thorburn in 1847. It was undoubtedly one of the early squash which was brought in with ships or as treasured trophies or importations.

In shape and general character of the color pattern this variety seems to resemble Virginia Mammoth, a moschata variety. The color of its seeds, however, classifies it as a maxima sort of which there is nothing quite like it in type. It apparently was exceedingly variable in quality and therefore probably variable in other respects.

Fruit large, 16-20 x 8-10 inches; weight 15-20 pounds. Shape oblong to oval, slightly enlarged near the apex; ribbed obscurely, furrows very shallow. Skin color ash gray spotted and marked with light drab along the furrows. Fruit stalk small. Shell thin, soft. Flesh medium thick, variable in texture, dryness and sweet-

ness, deep orange yellow. Seeds pure white, broader in proportion to their length than those of Hubbard or Boston Marrow.

Crown. Refs. 39, 40. Syns. Improved Crown, Select Crown.

This variety from Australia shows relationship to the turban shaped varieties which were commonly grown in this country 30 years ago. It is popular in Australia and is used both for pies and as a cooked vegetable.

It is one of the latest winter squashes, having required 140 days to attain maturity at Geneva. This was more than three weeks later than Hubbard, 10 days later than Etampes and 5 days later than Triangle. The vines are decidedly more vigorous than those of Hubbard and have much longer petioles and flower pedicels. The fruits are much smaller than Hubbard, somewhat shaped like Bay State but have more rounded shoulders, smaller seed cavity and darker colored flesh.

Plant trailing; vines coarse, very vigorous, 20-25 feet; branches many, basal, medial and apical. Cotyledons medium long and broad, 2 $\frac{1}{2}$ x 2 inches; nearly round; apex rounded; veining moderately prominent; color medium green. Leaves very shallowly lobed, moderately large, 11 x 17 inches; margin slightly serrated at the base, otherwise denticulate, moderately frilled; surface moderately smooth; color dark green; petiole very long and moderately slender, 18-22 inches. Flower—pistillate, moderately large, 6 inches across, pale orange, veins prominent, moderately dark green, petals slightly curved; ovary drum-like; sepals moderately short and medium slender, $\frac{3}{4}$ - $\frac{7}{8}$ inch;—staminate, moderately small, 4 $\frac{1}{2}$ inches across, petals distinctly curved, veins slightly lighter green; sepals medium long and medium heavy, 1 inch; pedicel long, 10-12 inches.

Fruit small, 6-7 x 9-10 inches; weight 10-12 pounds. Shape drum-like, sides and shoulders moderately curved; apex slightly depressed, base flattened; ribbed moderately wide; furrows shallow; surface smooth. Blossom scar with button $\frac{1}{4}$ - $\frac{1}{2}$ inch, in center of acorn 2-5 inches in diameter, usually depressed, occasionally protuberant, giving the fruit a crown-like appearance. Skin color gray (storm gray) occasionally mottled with light gray (court gray). Fruit stalk moderately long, 4-5 inches, curved, rough and corky. Shell hard and moderately thick, $\frac{1}{8}$ - $\frac{1}{4}$ inch. Flesh moderately thick at the base and medial, 1 $\frac{1}{4}$ -1 $\frac{1}{2}$ inches, moderately thin at the apex, $\frac{3}{4}$ -1 inch; texture moderately fine, very firm and hard, slightly stringy, moderately dry; moderately sweet, fair flavor; quality fair to moderately good; color deep yellow (capucine yellow). Seed cavity moderately small, in center and nearest the apex; placental tissue abundant, moist, very stringy, difficult to remove.

Seed moderately large; moderately long, medium broad and plump, 2.1 x 1.3 x .48 cm. (88 per oz.); face smooth or slightly pitted, moderately glossy brown (snuff brown I); margin prominent, slightly swollen, rounded, smooth, pale buff (cream buff) in color.

Delicious. Refs. 30, 31, 32, 33, 41, 60, 61, 73, 81, 97, 112, 122, 129. Syn. New Delicious Winter.

It has been said "A squash without fine quality is no better than a pumpkin and is not worth raising." Delicious introduced by James J. H. Gregory & Sons of Marblehead, Massachusetts, as a novelty in 1903, is regarded by many as the finest of all squashes in quality. No statement of origin other than that given in the Gregory catalog of 1904 has been found. This attributes its origin to Faxon crossed with other sorts, among them the large Brazilian blue varieties. From its appearance no clue other than a shape somewhat like



GOLDEN HUBBARD

(Two-thirds natural size)



Faxon is offered, although Gregory says, "About every variety we ever knew enters into its composition." Delicious has become the leading fall variety, it keeps well and is suited to roadside and family trade.

Delicious matured at Geneva in 110 days, 5 days earlier than Hubbard, in season with Kitchenette and 10 days later than Quality. The vines are similar to and equally as vigorous as those of Hubbard, with ovaries of the pistillate flowers turbinate instead of curved spindle-shape. The fruits are slightly larger than those of Quality, longer and more gradually tapered towards the apex.

Plant trailing; vines medium coarse, moderately vigorous, 12-15 feet; branches medium in number, basal. Cotyledons medium long and moderately broad, $2\frac{3}{4} \times 1\frac{7}{8}$ inches; broad oval; apex tapered; color medium green, occasionally with a grayish tinge. Leaves shallowly lobed; moderately small, 10×14 inches; margin denticulate, slightly frilled; surface smooth; color dark green. Flower—pistillate, medium large, $5-5\frac{1}{2}$ inches across, yellow; ovary turbinate; sepals moderately short and moderately slender, $\frac{3}{4}$ inch;—staminate, moderately small, $4-4\frac{1}{2}$ inches across; sepals medium long and very slender, 1 inch; pedicle medium long, 8-9 inches.

Fruit small, 8-9 x 7-8 inches; weight 6-9 pounds. Shape turbinate, slightly depressed at the base, ribbed widely; furrows rather shallow; surface rather rough, moderately pock-marked. Blossom scar with button $\frac{1}{4}$ inch long. Skin color dull green (dark ivy green) spotted with gray (court gray to light mineral gray) to conform with the pock-marks, and marked with narrow gray (court gray) streaks radiating from the apex towards the medial, often inconspicuous. Fruit stalk moderately short, 2-3 inches, round, slightly curved, rough and corky. Shell moderately hard and medium thick, $\frac{1}{8}$ inch. Flesh moderately thick at the medial and apex, $1\frac{1}{4}-1\frac{1}{2}$ inches, often very thick at the base, 2-2 $\frac{1}{2}$ inches; texture very fine, firm, crisp, dry; sweet and very good flavor; quality excellent; color orange (cadmium orange to orange buff). Seed cavity moderately small, medium amount of placental tissue which is moderately moist, moderately stringy and easily removed.

Seed medium size; medium long and moderately narrow, moderately plump, $1.85 \times .90 \times .36$ cm. (144 per oz.); face surface wrinkled, glossy white; margin rounded, smooth.

Essex Hybrid. Refs. 14, 26, 30, 31, 33, 37, 38, 41, 46, 47, 50, 52, 59, 61, 73, 89, 96, 98, 101, 108, 115, 128, 129, 130, 134, 135, 137. Syns. Essex, Essex Hardshell Turban, Low's Premium Hybrid, Improved American Turban.

The Hon. Aaron Low, seedsman, of Essex, Massachusetts, in passing over a field of American Turban squashes noticed a vine with a number of decidedly different squash. The three squash on this vine seemed to show characteristics of both the Turban and Hubbard varieties. This was in 1879, and four years later after selecting for hard shell and a more orange color this new squash was introduced in 1883 by Burpee, Ferry, Gregory, Sibley and Vick. Others were quick to see its possibilities and since then the variety has been one of the most treasured sorts to grow for market and winter storage.

At Geneva 125 days were required for this variety to reach maturity, 5 days earlier than Etampes, in season with Victor and 10 days later than Hubbard. The vines are considerably less vigorous than those of Victor, have smaller leaves and flowers with the stigmas

decidedly more expanded than those of Victor and the ovaries more oblate. The fruits are much less warted than those of Victor and shaped much the same as Bay State. The skin color is a much deeper orange than American Turban and somewhat less deep orange than Warren.

Plant trailing; vines moderately coarse, moderately vigorous, 10-12 feet long; branches many, basal. Cotyledons moderately long and broad, $3 \times 2\frac{1}{4}$ inches; oval; apex moderately rounded; color medium green; leaves very shallowly lobed, moderately small, 9×14 inches; margin denticulate, frilled; surface moderately smooth to somewhat crumpled; color medium green; petiole moderately short and slender, 12-14 inches. Flower—pistillate, medium size, $5-5\frac{1}{2}$ inches across, yellow; ovary drum-like, pale yellowish cream mottled with pale green; sepals moderately short and slender, $\frac{1}{2}-\frac{3}{4}$ inch;—staminate, moderately small, $4-4\frac{1}{2}$ inches across; stigma distinctly expanded and curved; sepals medium long and very heavy, 1 inch; pedicle short, 5-6 inches.

Fruit moderately small, 8-9 x 11-12 inches, weight 10-12 pounds. Shape drum-like, slightly depressed at the base; surface much wrinkled and warted over the entire area, moderate in depth. Skin color deep orange red (coral red to flame scarlet), indistinctly marked with (apricot orange) stripes which radiate from the apex, two-thirds the length of fruit, $\frac{1}{4}-\frac{1}{2}$ inch in breadth. Acorn very prominent, 3 to 5 inches in diameter, usually slightly protuberant and ranging in color from pinkish buff (light ochraceous salmon) to grayish green (pea green) or a combination of both. Fruit stalk medium long, 3-4 inches, round, moderately curved, corky. Shell hard, woody, $\frac{1}{4}$ inch thick. Flesh thickest at the base and medial, $1\frac{1}{4}-1\frac{1}{2}$ inches; apex very thin, $\frac{1}{2}$ inch, texture medium fine, slightly stringy, tender, moderately moist; moderate flavor and sweetness; quality fair; color orange (deep chrome to mikado orange). Seed cavity large, in center and towards apex; placental core and tissue very prominent, moist, tender, often rather difficult to remove.

Seed medium large; medium length and width, plump, $1.82 \times 1.04 \times .43$ cm. (112 per oz.); face wrinkled, moderately glossy white; margin rounded, smooth.

Etampes. Refs. 14, 33, 41, 49, 50, 59, 73, 101, 108, 129, 130, 137. Syns. Bright Red Etampes, Etampes Bright Red Mammoth, Etampes Mammoth Red, Large Bright Red Etampes, Large Red Etampes, Mammoth Bright Red Etampes, Mammoth Etampes, Mammoth Red Etampes Marrow, New Marrow Pumpkin, Red Etampes.

This is a French variety which was brought to this country and offered for sale in 1883 by W. Atlee Burpee & Co. of Philadelphia. The fruits are attractive because of the glossy bright orange-red skin color. At one time it was little used but during the last ten years its importance has increased and in some sections it is the most important pumpkin grown. For nearly a hundred years it has been one of the most important varieties grown in France. A strain sold as Morse's Marrow has at Geneva produced earlier and slightly smaller fruits.

One hundred and thirty days were required to mature this variety, 10 days later than Mammoth, 5 days later than Essex Hybrid and 5 days earlier than Triangle. The vines are somewhat more vigorous than those of Mammoth, have lighter green foliage and considerably larger flowers which are decidedly more soft and velvet-like, and more frilled and curved at the margins. The fruits are similar in shape to the Cheese pumpkin, but are larger in all respects; also

considerably smaller and much more oblate and more uniform in shape than Mammoth.

Plant trailing; vines medium coarse, very vigorous, 18–20 feet; branches many, basal and medial. Cotyledons moderately long and very broad, $3\frac{1}{4} \times 2\frac{3}{8}$ inches; oval; apex moderately rounded; veining moderately prominent; color moderately light green. Leaves very shallowly lobed, almost entire; medium large, 10 x 16 inches; margin slightly serrate at the base, otherwise denticulate, moderately frilled; surface moderately smooth, occasionally somewhat crumpled; auricles distinctly ascending, often nearly vertically parallel to each other; color moderately light green; petiole medium long and heavy, 14–16 inches. Flower—pistillate, large, $7\frac{1}{2}$ inches across; pale orange, very soft and velvet-like, margin frilled and curved; ovary nearly globular, flattened at base and apex, yellowish cream in color; sepals very short and moderately slender, $\frac{1}{4}$ – $\frac{3}{8}$ inch, much darker green than on staminate flowers;—staminate, medium large, 5 inches across, very soft and velvet-like, margins curved and frilled; sepals moderately short and moderately slender, $\frac{3}{4}$ inch, pedicel short, 6–7 inches.

Fruit medium large, 9–10 x 16–18 inches; weight 30–35 pounds. Shape oblate, depressed at base and apex; ribbed widely; furrows very shallow; surface smooth, occasionally somewhat uneven. Blossom scar with button $\frac{1}{4}$ – $\frac{1}{2}$ inch long, usually surrounded with a narrow, cork-like ring. Skin color orange red (carrot red to orange chrome). Fruit stalk medium long, 3–4 inches, round, slightly curved, rough, corky. Shell moderately soft and thin, $\frac{1}{8}$ – $\frac{1}{6}$ inch. Flesh very thick at the medial, 2– $2\frac{1}{4}$ inches, thick at the base and apex, $1\frac{1}{2}$ – $1\frac{3}{4}$ inches; texture coarse, fibrous, moderately moist, medium tender; quality fair to poor, insipid; color deep yellow (cadmium yellow to deep chrome). Seed cavity moderately large contains much placental tissue which is moist, tough and difficult to remove.

Seed moderately large; moderately long, narrow and medium plump, $2.2 \times 1.15 \times .35$ cm. (96 per oz.); face slightly wrinkled, glossy white; margin rounded, smooth.

Faxon. Refs. 17, 26, 28, 30, 33, 47, 64, 73, 111, 116, 130. Syns. Faxon's Brazilian, Faxon's New Brazilian, New Brazilian.

The Faxon squash came originally from southern Brazil and was named by M. B. Faxon of Saugus, Massachusetts. Seed had been sent by E. S. Rand to B. K. Bliss of New York. Vaughan's Seed Store, Chicago, listed it in 1894, and it was soon carried by all leading houses.

When first introduced the type was not fixed as to the color, the fruits ripening in two colors, sage green and orange. In other characters it proved to be a superior variety of good constitution, early and a good keeper. For many years it was considered a valuable addition to squash lists, but inasmuch as it never became pure as to color and because newer sorts were superior, it gradually was replaced in trade lists.

Mature fruits of the Faxon were produced at Geneva in about 105 days, which was 5 days earlier than Golden Hubbard, in season with Golden Delicious, and 5 days later than Boston Marrow. Modern stocks are mixed with a small green Hubbard-like fruit. For the purpose of this account the description to follow relates to the type as introduced. This variety most resembles in shape the short turbinate type of Golden Delicious, being more rotund and somewhat rougher in skin texture.

Plant trailing; vines moderately slender, medium vigor, 8–10 feet long; branches moderately few, medial. Flower—pistillate, large, 7 inches across, bright lemon yellow; ovary somewhat turbi-

nate, sepals medium long and slender, 1 inch;—staminate, 6 inches across; sepals medium long and thick, $1\frac{1}{4}$ inches; both sexes delicately frilled about the margin.

Fruit small, 9–10 x 9–10 inches; weight 6–7 pounds. Shape somewhat turbinate, slightly depressed about the stem, rounded at the medial and abruptly tapering at the apex; ribbed widely; furrows shallow, surface slightly wrinkled and obscurely pock-marked. Skin color pale salmon (ochraceous salmon) narrowly striped for three-fourths the length of fruit radiating from the apex with pale pink (pale flesh color), often sparsely and irregularly blotched with the same color. Fruit stalk moderately short, 2–3 inches, round, straight, rough, soft and spongy. Shell moderately hard and rather thin, $\frac{1}{8}$ inch. Flesh thickest at the base, $1\frac{1}{4}$ inches; texture very fine, fiberless, moderately good; color deep yellow (cadmium yellow). Seed cavity moderately large.

Seed moderately large; moderately long, narrow and moderately plump, $2.1 \times 1.1 \times .38$ cm. (100 per oz.); face wrinkled, glossy white; margin rounded, smooth.

French Turban. Refs. 1, 4, 7, 14, 19, 24, 26, 27, 31, 41, 42, 43, 44, 50, 54, 65, 101, 103, 116, 130, 133, 137. Syns. Acorn, California, Giraumon Turban, Turban, Turban Pumpkin, Turks Cap.

This may represent the original of this oddly shaped squash. The name Acorn was used because of its resemblance in the younger stage to an acorn, while at the more mature stage it looked much like an immense Turkish turban. There were possibly several turban-shaped squash known which more or less accentuated this characteristic, but from early writing and descriptions all were rather poor in quality. The name Turban occurred in the Almanach du Bon Jardinier in 1818 while the name Acorn occurred as early as 1827 in the catalog of J. B. Russell. Many photographs have been published which show diverse types, some of which might even be called plant monstrosities. A large number of forms are shown in a recent Russian publication (22). The various specimens shown were collected largely from South America or Asiatic sources and show rather widespread use of this group. Selections made within the group after 1850 tended to eliminate extreme turban shapes and to evolve types which merely show a well-marked but non-protruding crown.

At Geneva 115 days were required for this variety to reach maturity, 10 days earlier than Essex Hybrid, in season with Hubbard and 15 days later than Boston Marrow. The plants are much less vigorous than those of Essex Hybrid. The fruits are smaller and have a distinctly larger, more protuberant turban with a proportionately smaller per cent of edible portion.

Plant trailing; vines rather slender, weak, 8–10 feet, very dark green; branches moderately few, basal. Leaves small, 9 x 13 inches, shallowly lobed; margin moderately frilled, denticulate; surface occasionally blistered. Pistillate flowers moderately large, 6 inches across, light orange; ovary drum-like, distinctly expanded at the apex; stigma very irregular and expanded.

Fruit small, 7–8 x 10–12 inches; weight 8–10 pounds. Shape drum-like, with acorn very prominent and protuberant, fully one-third to one-half of the fruit; surface moderately smooth. Skin color basal portion is deep orange (apricot orange to peach red) often in the form of an irregular lace-like color pattern, within the mesh of which is a dull red (carrot red) ground color. The acorn is usually pink (pinkish buff) very sparsely streaked or blotched with orange (apricot orange) and often having considerable gray (light mineral gray) on it. Shell medium thick and moderately

soft. Flesh moderately thick at base, $1\frac{1}{4}$ – $1\frac{1}{2}$ inches, but thin at apex; texture fine, rather juicy, tender; light orange (orange buff); quality poor.

Seeds wrinkled, glossy white, medium size.

Gilmore. Refs. 33, 41, 129.

Originating as the result of a cross between Winnebago and Arikara this was introduced in 1926 and named for Dr. Melvin R. Gilmore, Museum of Anthropology, University of Michigan, who had previously introduced several squash varieties which had been and are still cultivated by the Plains Indians. Oscar H. Will & Co., Bismarck, North Dakota, selected from the cross a type in shape somewhat like Winnebago but in earliness and color like the Arikara.

Gilmore required 115 days to reach maturity at Geneva. This was 5 days earlier than Winnebago, 10 days earlier than Banana and in season with Hubbard. The vines are less vigorous than those of Winnebago and Banana but otherwise are very similar to them. The fruits are similar in shape to Banana, but are more wrinkled and warted as well as being salmon orange in color.

Plant trailing; vines medium coarse, medium vigor, 8–10 feet; branches few, basal. Cotyledons moderately long and very broad, $3 \times 2\frac{1}{4}$ inches; short oval to nearly round; apex tapered. Color moderately light green. Leaves very shallowly lobed, moderately small, 9×14 inches; margin slightly serrated at the base, otherwise denticulate, slightly frilled; surface smooth; color medium green; petiole short and moderately slender, $1\frac{1}{2}$ inches. Flower—pistillate, medium large, 5 inches across, yellow; ovary long and cylindrical, slightly tapering at base and apex; sepals very short and slender, $\frac{3}{8}$ inch;—staminate, moderately small, 4 inches across; sepals moderately short and moderately slender, $\frac{3}{4}$ inch, rather heavily pubescent; pedicel very short, 4–5 inches.

Fruit moderately small, $15\text{--}18 \times 5\text{--}6$ inches; weight 6–8 pounds. Shape cylindrical, moderately tapering towards base and apex; surface wrinkled and shallowly warted. Blossom scar with button $\frac{1}{4}$ – $\frac{1}{2}$ inch long. Skin color orange (salmon orange to ochraceous salmon) marked with streaks of variable width radiating from the apex one-half to two-thirds length of fruit, buff pink (pale ochraceous buff) in color; often marked with small longitudinal blotches at the base and medial with the same color; extreme apical area blotched with dark green (dull blackish green) and streaked with pale green (sage green) to conform with the streaks of the major color pattern. Fruit stalk short, 1–2 inches, round, slightly curved, rough and corky. Shell moderately hard and medium thick, $\frac{1}{8}$ inch. Flesh moderately thin, $\frac{3}{4}$ –1 inch, somewhat thicker at the base, $1\frac{1}{2}$ – $1\frac{3}{4}$ inches; texture fine, firm, crisp; moderately sweet, moderately good flavor; quality good; color deep yellow (capucine yellow to light cadmium). Seed cavity large, conforms to fruit shape, has much placental tissue which is moist, stringy and difficult to remove.

Seed moderately large; moderately long, moderately narrow and plump, $2.1 \times 1.2 \times .50$ cm. (76 per oz.); face smooth, brown (snuff brown); margin ridged, corky, dull white (cartridge buff).

Golden Bronze. Refs. 31, 61, 121, 130.

Golden Bronze was said to have been a selection from a cross between Bay State and Boston Marrow, and was introduced in 1899 by James J. H. Gregory & Sons of Marblehead, Massachusetts. From pictures and descriptions it was very much like the Boston Marrow parent except in the dark grayish green color showing bronzing on the upper side. It possessed similar pock-mark skin irregularities of Boston Marrow, was nearly as early in maturing and slightly smaller in size.

Fruit moderately small, $10\text{--}12 \times 8\text{--}10$ inches; weight 8–10 pounds. Shape medial nearly globular, tapering abruptly to the apex and gradually tapering towards the base; surface wrinkled and distinctly pock-marked. Skin color dark grayish green turning to bronze green during storage. Shell hard and moderately thick. Flesh medium thick, texture fine, sweet, good flavor, bright golden yellow in color; quality good.

Golden Delicious. Refs. 33, 41, 129.

Two of the most widely grown squash varieties were used as the parents of this modern sort. Boston Marrow was chosen because of its color and earliness while Delicious was used for its size and quality. From the many forms coming from the cross the type later named and introduced as Golden Delicious was selected. The original cross was made some four years before the date of introduction in 1926 by Gill Bros. Seed Co. of Portland, Oregon. For canners this has proved to have unusual qualifications, for in addition to the orange skin color it has thick flesh high in starch content which will pack a product of desirable consistency. For this reason it is often used to blend with other varieties.

Golden Delicious attained maturity at Geneva in 105 days, 5 days earlier than Delicious and Golden Hubbard and 5 days later than Boston Marrow. Vines of these three varieties are similar, although the leaves of Golden Delicious are larger and the ovaries of the pistillate flowers distinctly turbinate. The fruits are similar in size and shape to Delicious, differing chiefly in color of skin.

Plant trailing; vines medium heavy, moderately vigorous, 12–15 feet; branches moderately many, basal. Cotyledons medium long and very broad $2\frac{3}{4} \times 2\frac{1}{4}$ inches; short oval to nearly round; apex rounded, color medium green. Leaves very shallowly lobed, nearly entire, medium large, 10×16 inches; margin denticulate and slightly frilled; surface moderately smooth; color moderately dark green; petiole medium long and heavy, 14–16 inches. Flower—pistillate, medium large, $5\frac{1}{2}$ –6 inches across, pale yellow; ovary turbinate; sepals moderately short and moderately slender, $\frac{3}{4}$ inch;—staminate, moderately small, $4\frac{1}{2}$ –5 inches across; sepals medium long and moderately slender, $1\frac{1}{4}$ inches; pedicel short, 6–7 inches.

Fruit small, $8\text{--}10 \times 8\text{--}9$ inches; weight 6 to 9 pounds. Shape turbinate; ribbed widely; furrows very shallow; surface finely wrinkled, occasionally somewhat pock-marked. Blossom scar with button $\frac{1}{2}$ – $\frac{3}{4}$ inch long. Skin color orange to orange red (apricot orange to rufous) marked with narrow, pinkish buff (light ochraceous salmon) stripes which radiate from the apex one-third to one-half length of fruit, and often with a very small, dark green (slate green) area at the extreme apex. Fruit stalk moderately short, 2–3 inches, curved, rough and corky. Shell moderately hard and thin to medium thick, $\frac{1}{8}$ – $\frac{1}{4}$ inch. Flesh thick at the base, $1\frac{1}{2}$ – $1\frac{3}{4}$ inches, moderately thick at medial and apex, $1\frac{1}{4}$ – $1\frac{1}{2}$ inches; texture fine, crisp, moderately dry; moderately sweet and fair flavor; quality good; color orange (cadmium yellow to capucine yellow). Seed cavity medium large, contains moderately much placental tissue which is moderately dry and tender, moderately easy to remove.

Seed medium large; medium length and width, moderately plump, $1.85 \times 1.04 \times .38$ cm. (128 per oz.); face wrinkled, glossy white; margin rounded, smooth.

Golden Hubbard. Refs. 30, 33, 38, 41, 60, 61, 73, 81, 101, 121, 129, 130. Syns. Genesee Golden, Genesee Red Hubbard, Golden Warted Hubbard, Hard Shelled Marrow, New Red Hubbard, Red Hubbard.

For many years after the Hubbard squash was introduced it made little headway with commercial

gardeners. This was attributed to the pale, unassuming color of the Hubbard as contrasted with the yellow orange of Autumnal Marrow. D. M. Ferry in 1898 introduced Golden Hubbard which they had grown in trial the two previous seasons. The origination of this most promising squash was attributed to J. J. Harrison of the Storrs & Harrison Co., Painesville, Ohio.

This variety matured in 110 days at Geneva, 5 days earlier than Hubbard, in season with Delicious and 10 days later than Boston Marrow. Vines much the same as those of Hubbard with the flowers slightly smaller. The fruits are slightly smaller than those of Hubbard with the flesh darker and more uniformly orange yellow in color and considerably drier than that of Boston Marrow.

Plant trailing; vines medium coarse, moderately vigorous, 12-15 feet; branches many, basal. Cotyledons medium long and moderately broad, $2\frac{5}{8} \times 1\frac{7}{8}$ inches; oval; apex moderately tapered; color medium green. Leaves very shallowly lobed, moderately small, 9×15 inches; margin slightly serrated near the base, otherwise denticulate, moderately frilled; surface moderately smooth, occasionally coarsely crumpled; color moderately dark green; petiole short and moderately heavy, 10-12 inches; pedicle very short, 4-5 inches.

Fruit moderately small, 10-12 x 8-9 inches; weight 8-10 pounds. Shape thick falcate-fusiform; base abruptly tapered to a moderately thick neck, slightly constructed. Ribbed widely; furrows shallow; surface wrinkled, uneven and moderately warted. Blossom scar with button $\frac{1}{4}$ - $\frac{1}{2}$ inch. Skin color orange to orange red (carmelian red to rufous), marked with narrow, pinkish buff (light ochraceous salmon) stripes which radiate from the apex for one-third to one-half length of fruit, occasionally blotched with the same color; extreme apical area marked with an irregular, dark green (slate olive) area. Fruit stalk moderately short $2\frac{1}{2}$ -3 inches. Flesh thickest at the base and apex; texture moderately fine, crisp, firm, moderately dry; moderately sweet, good flavor; quality good; color orange yellow (cadmium orange to capucine yellow.) Seed cavity moderately large, contains medium amount of placental tissue which is moderately dry, tender and easily removed.

Seed moderately large; moderately long, narrow and plump, $2.0 \times 1.1 \times .48$ cm. (88 per oz.); face wrinkled, glossy white; margin rounded and smooth.

Gray Boulogne. Refs. 14, 50, 101, 130, 137.

This variety, when first listed about 1884 by W. Atlee Burpee, was introduced as a new foreign pumpkin. Its name comes from the town Boulogne-sur-Seine, south of Paris, France.

This French variety somewhat resembles Etampes in general shape although it is more obscurely furrowed. In skin color and character the two are, however, quite distinct.

Plant trailing; vines very vigorous, 20-25 feet, dark green at the base, blending into pale green towards the medial and apex; leaves large, nearly entire, deep green, margin denticulate, petioles long and slender.

Fruit small; 8×12 inches, reported to be as much as 30 inches in diameter under a more favorable environment. Shape distinctly oblate, depressed at base and apex; ribs obscure, furrows very shallow; surface dark green finely shaded and mottled with pale yellowish green, finely crossmarked and streaked with gray netting over much of the area. Flesh thick, moderately dry, rather granular, yellow, fair quality.

Hester. Refs. 97, 130. Syns. New Hester, Yellow Sibley.

About 1889 Mr. William Hester secured some stock seed of Sibley from the originator of that variety. From

this lot, a plant which produced pale yellow or cream-colored fruits was discovered. Continued selection led to the introduction of the variety as Yellow Sibley in 1899 by the Iowa Seed Co. A year later the name was changed to Hester and was carried by this concern until about 1918. Apparently the fruits were similar in shape to Sibley, possibly being more elongated. The skin was pinkish yellow, slightly striped at the apex with light green.

Honolulu. Refs. 24, 125, 131. Syn. Nectarine.

The Massachusetts Horticultural Society in its report for 1860 notes that the Honolulu Nectarine squash was exhibited by Josiah Newhall. Grant Thorburn, New York City, offered it in his catalog of 1861 and likewise Hovey & Co., Boston, Massachusetts, in 1863 as a new winter variety.

In some respects the shape resembled that of Faxon, differing from that variety by being more globular and more deeply furrowed. Like Faxon considerable variation existed in color of the skin, a factor which probably attributed to its instability as a standard variety.

Plant trailing; vine coarse and moderately vigorous, 12-15 feet. Leaves very large, petioles often 3 feet long.

Fruit large; somewhat oblate to globular, depressed about the stem; ribbed broadly; furrowed moderately deep; skin color ash green, often striped and variegated with drab or lighter shades of green. Flesh thick, rather moist, slightly sweet, moderately dry, reddish orange.

Hubbard. Refs. 1, 2, 11, 14, 20, 21, 23, 24, 25, 26, 27, 28, 31, 33, 36, 37, 41, 43, 45, 46, 48, 49, 50, 52, 53, 54, 55, 56, 57, 59, 60, 61, 64, 67, 73, 80, 89, 94, 96, 98, 100, 101, 115, 116, 120, 121, 122, 125, 129, 130, 131, 132, 135, 137. Syns. Green Hubbard, Green Mountain, Improved Hubbard, Mammoth Hubbard, New Sweet Hubbard, Smooth Hubbard, Winter.

Hubbard, the best known and most universally grown of all winter squash, owes its introduction to James J. H. Gregory of Marblehead, Massachusetts. The record of its early history was given several times by Mr. Gregory and one version contained in a letter of December 23, 1857, written to the Magazine of Horticulture is here repeated.

"Of the origin of the Hubbard squash we have no certain knowledge. The facts relative to its cultivation in Marblehead are simply these. Upwards of twenty years ago, a single specimen was brought into town, the seed from which was planted in the garden of a lady, now deceased; a specimen from this yield was given to Captain Knott Martin, of this town, who raised it for family use for a few years, when it was brought to our notice in the year 1842 or '43. We were first informed of its good qualities by Mrs. Elizabeth Hubbard, a very worthy lady, through whom we obtained seed from Capt. Martin. As the squash up to this time had no specific name to designate it from other varieties, my father termed it the 'Hubbard Squash.'"

In a subsequent publication Mr. Gregory states



(Two-thirds natural size)

HUBBARD



that the first specimen was brought to Marblehead in 1798 from Boston by a market man named Green. The shape of the fruit brought the remark that it was "turned up like a Chinese shoe." It is most probable that this variety came to New England in the hands of a sea captain who secured it in trade from the West Indies or South America. In regard to its use the following was written soon after its introduction: "In the variety Hubbard are to be found many of the fundamental characters which as a table vegetable rank it with the onion and the turnip and for pastry purposes second only to the apple."

The Hubbard has been repeatedly crossed with many varieties of squash. As a result of these crossings many modern stocks or strains will give a varied assortment of shapes and sizes even though they hold to the green color. The Blue Hubbard and Golden Hubbard have many of the characters of the Hubbard, varying chiefly in color, while Kitchenette and Brighton came from a strain which had been selfed in 1914 by Richard Wellington at Minnesota. In 1860 the Massachusetts Horticultural Society presented a special gratuity to Mr. Gregory for the introduction of the Hubbard squash.

This favorite and most widely known variety matured in 115 days at Geneva, 5 days earlier than Blue Hubbard, in season with Marblehead and 5 days later than Delicious and Golden Hubbard. The vines are less vigorous than those of Blue Hubbard and Chicago Warty Hubbard, and have smaller leaves and flowers. The fruits are slightly smaller than those of Chicago Warty Hubbard, distinctly smoother skin and have a lighter, less uniformly colored flesh.

Plant trailing; vines moderately slender, vigorous, 12-15 feet long; branches moderately many, basal. Cotyledons moderately long and moderately broad, $2\frac{3}{4} \times 1\frac{3}{4}$ inches; oval, apex moderately tapered; veining moderately prominent; color grayish green. Leaves very shallowly lobed, moderately large, 9×13 inches; margin denticulate, slightly serrated near the base of the blade, moderately frilled; color moderately dark green; petiole medium long and heavy, 14-16 inches. Flower—pistillate, medium size, $5-5\frac{1}{2}$ inches across, pale orange yellow; ovary falcate-fusiform, very fuzzy; sepals short and slender, $\frac{1}{2}-\frac{3}{4}$ inch;—staminate, moderately small, $4\frac{1}{2}-4\frac{3}{4}$ inches across; sepals moderately short and slender, $\frac{3}{4}$ inch; pedicel moderately short, 7-8 inches.

Fruit medium large, 12-15 x 8-10 inches; weight 9 to 12 pounds. Shape falcate-fusiform, with the medial nearly globular; ribbed narrowly and irregularly; furrows shallow; surface slightly wrinkled and warted; blossom scar with button moderately prominent, $\frac{1}{2}-\frac{3}{4}$ inch long. Skin color deep dull green (dark ivy green) often marked with pale green (pea green) narrow stripes which radiate from the apex, varying from one-quarter to one-third the length of fruit, often inconspicuous or nearly absent. After storage the dark green is replaced with a dull bronze green (dark olive). Fruit stalk medium long $2\frac{1}{2}-3$ inches, round, curved, corky. Shell very hard, woody, thick, $\frac{1}{4}-\frac{3}{8}$ inch (lime green) in color. Flesh medium thick at the medial, $1-1\frac{1}{4}$ inches, often 2 inches near the apex and nearly solid at the base; texture fine, firm, crisp, dry; fine flavor, moderately sweet; quality excellent; color consists of a blend of yellow, greenish yellow and orange, major portion is (dull cadmium yellow). Seed cavity medium size, contains much placental tissue which is moderately moist, tender and easily removed.

Seeds medium large; medium length and width and moderately plump, $1.9 \times 1.17 \times .37$ cm. (112 per oz.); face smooth, glossy white; margin rounded, smooth.

Kitchenette. Refs. 33, 40, 41, 73, 114, 122, 123, 129.

Syns. Baby Hubbard, Kitchenette Hubbard, Little Hubbard.

Kitchenette, the baby in size and age of Mother Hubbard's family, came as the result of inbreeding a commercial strain of Hubbard. The work was initiated by Richard Wellington in 1914, at that time Horticulturist at the Minnesota College of Agriculture. The second year's effort resulted in 47 self-pollinated fruits, seed of which was planted separately. Repeated self pollinations resulted in a number of lines which produced fruits uniform in many characters. Finally some 24 lines were established and in 1919 three strains were distributed to a limited number of growers and experiment stations. Strain 20 was one of these and its continued use brought many favorable reports as to its desirability. In 1917 John W. Bushnell took over the experimental work on squash and was responsible for its final selection and naming.

As a premium for membership it was distributed in 1920 by the Minnesota State Horticultural Society and given the name Kitchenette because of its small size. The next year it was offered by the Cashman Seed Co. of Owatonna, and C. J. Lindholm, Minneapolis, Minnesota.

One hundred and ten days were required for this variety to reach maturity at Geneva, 5 days earlier than Hubbard, in season with Delicious and 10 days later than Quality. The vines are slightly less vigorous than those of Hubbard and have foliage lighter green in color and flowers with turbinate ovaries and distinctly larger sepals. The fruits are about the same size as Delicious and considerably smaller than those of Hubbard. They are much more abruptly tapered at the blossom end, usually more thickened and less curved at the neck than Hubbard.

Plant trailing; vines moderately slender, moderately light green and moderately vigorous, 10-12 feet; branches many, basal. Cotyledons moderately long and broad, 3×2 inches; oval; apex tapered; veining prominent; color grayish green. Leaves shallowly lobed, moderately small, 9×14 inches; margin somewhat undulate, denticulate and slightly frilled; surface smooth and occasionally somewhat crumpled; color moderately light green, very often having a silvery sheen; petiole moderately short, 12-14 inches. Flower—pistillate, medium large, $5-5\frac{1}{2}$ inches, yellow; ovary somewhat turbinate; sepals medium long and moderately slender, $1-1\frac{1}{4}$ inches;—staminate, moderately small, $4-4\frac{1}{2}$ inches across; sepals medium long and moderately slender, 1 inch. Pedicel moderately short, 7-8 inches.

Fruit small, $8-9 \times 7\frac{1}{2}-8\frac{1}{2}$ inches; weight 5 to 7 pounds. Shape medial somewhat globular; base tapering abruptly to a short constricted neck, slightly curved; apex nearly flat to very slightly pointed, ribbed rather widely; furrows moderately deep; surface moderately wrinkled and warted. Blossom scar with button $\frac{1}{4}-\frac{1}{2}$ inch long. Skin color deep green (dull greenish black 2) marked with narrow pale green (pea green) stripes which radiate from the apex one-third to one-half length of fruit and conform with the most prominent furrows. Fruit stalk moderately short, $2-2\frac{1}{2}$ inches, round, slightly curved, rough and corky. Shell very hard and thick, $\frac{1}{4}$ inch, pale green (lime green) in color. Flesh medium thick at the medial and apex $1-1\frac{1}{4}$ inches, solid 2-3 inches at the base; texture very fine, dry, crisp, tender; sweet, well flavored; quality good; color deep yellow (cadmium yellow). Seed cavity

moderately small, placental tissue moderately abundant, rather moist, somewhat fibrous, easily removed.

Seed medium large; medium long and moderately narrow, plump, 1.94 x 1.1 x .44 cm. (80 per oz.); face wrinkled, glossy white; margin rounded, smooth.

Knobby Leviathan. Refs. 101, 121, 130. Syns. Heart O' Gold, Large Warted Portugal.

In 1930 James J. H. Gregory & Son, Marblehead, Massachusetts, listed Knobby Leviathan. This was grown at Geneva and fruit specimens strongly resembled the illustration of Heart O' Gold published by Peter Henderson & Co., New York, thirty years earlier.

Fruits were produced at Geneva in 120 days, in season with Blue Hubbard and 10 days later than Golden Hubbard. The plants are equally as vigorous as those of Golden Hubbard and have more blistered leaves. The fruits are more like Golden Delicious in general shape, have more angular shoulders and are decidedly rougher and more furrowed.

Plant trailing; vines moderately coarse, moderately vigorous, 12-15 feet. Leaves medium large, 10 x 15 inches, nearly entire, margin undulate; surface slightly blistered.

Fruits large; 12-18 x 9-14 inches; weight 20-25 pounds, occasionally much heavier. Shape turbinate; ribbed very narrowly, furrowed deeply, surface wrinkled, often profusely corrugated; skin color orange and (flame scarlet.) Shell moderately soft and thin, $\frac{1}{16}$ inch. Flesh thick at medial and apex $1\frac{1}{2}$ inches, very thick at base, 2-2 $\frac{1}{2}$ inches; texture moderately coarse, slightly stringy, rather moist; fair flavor and sweetness, orange color; quality fair.

Seed medium large; medium long, moderately narrow and medium plump, 1.93 x 1.04 x .34 cm. (128 per oz.); face smooth, dull white; margin rounded, smooth.

Mammoth. Refs. 14, 19, 21, 24, 26, 27, 31, 33, 41, 42, 44, 45, 50, 64, 73, 90, 101, 129, 130, 137. Syns. Big Jumbo, Big Show, Enormous, Genuine Mammoth, Giant, Giant of All, Globe Mammoth, Golden Yellow Mammoth, Hundredweight, Improved Mammoth, Jumbo, Jumbo Pumpkin, King of All the Mammoths, King of the Giants, King of the Mammoths, Large Mammoth, Large Mammoth Yellow Potiron, Large Yellow, Large Yellow Mammoth, Mammoth \$50.00 Pumpkin, Mammoth King, Mammoth Prize, Mammoth Yellow, Mammoth Yellow Potiron, Michigan Mammoth, Mills Giant Pumpkin, Mills Giant Squash, Mohawk Valley Giant, Monster Yellow, New Mammoth Jumbo, Persian Golden Giant, Peruvian Mammoth, Potiron, Prize Potiron, Southern Mammoth, True Potiron, Yellow Mammoth, Yellow Monster.

This is the largest-fruited variety of *Cucurbita* grown and as commonly known is the leading example of the confused and dual use of the terms squash and pumpkin. These common terms have been applied interchangeably to the many strains of this "Jumbo" of the vegetable kingdom. The many names under which this form has been grown indicate the popular fancy for any plant producing either foliage or fruits of an abnormal character. The fruits are commonly used for stock feed and this has served to keep the variety under cultivation.

When Mammoth was first grown is not known, but the name does occur in trade lists as early as 1834. The large Potiron of Europe has long been popular and must have been among the early varieties brought from the New World to the Old.

Mature fruits were produced at Geneva in 120 days, 10 days earlier than Etampes, in season with Blue Hubbard and 5 days later than Hubbard. The vines are slightly less vigorous than those of Etampes, having darker foliage and decidedly smaller, less soft, and velvet-like flowers. The fruits are decidedly the largest of all *C. maxima* varieties, being more nearly globular than Etampes and more variable in skin color.

Plant trailing; vines coarse, vigorous, 15-18 feet; branches many, basal and medial. Cotyledons moderately long and broad, 3 x 2 inches; oval; apex rounded; veining moderately prominent; color moderately light green. Leaves practically entire, very shallowly lobed, medium large, 10 x 16 inches; margin denticulate, slightly frilled; color moderately dark green; petiole medium long and moderately slender, 14-16 inches. Flower—pistillate, moderately small, 4 $\frac{1}{2}$ inches across, pale orange; ovary globular; sepals very short and moderately slender, $\frac{3}{8}$ - $\frac{1}{2}$ inch;—staminate, moderately small, 4 $\frac{1}{2}$ inches across; sepals moderately short and moderately slender, $\frac{3}{4}$ inch; pedicle short, 5-6 inches.

Fruit very large, 15-18 x 18-24 inches; weight 35-50 pounds, often much larger. Shape nearly globular, slightly depressed at the base, full at the apex; ribbed widely, furrows moderately shallow; surface moderately smooth, occasionally somewhat rough. Blossom scar with button $\frac{1}{8}$ inch. Skin color orange (salmon orange to rufous) marked with moderately narrow, buff (light ochraceous salmon) stripes which radiate from the apex one-half to three-quarters length of fruit; often blotched with the same color. Fruit stalk moderately short, 2 $\frac{1}{2}$ -3 inches, round, slightly curved, rough and corky. Shell soft and thin, $\frac{1}{16}$ inch. Flesh thick, 1 $\frac{1}{2}$ -1 $\frac{3}{4}$ inches; texture coarse, moderately fibrous, very moist; quality poor; color variable, moderately light yellow to deep orange (pale ochraceous buff to deep chrome). Seed cavity very large, moderate amount of placental tissue which is moist, tough, stringy and difficult to remove.

Seed moderately large; moderately long, narrow and medium plump, 2.04 x 1.02 x .35 cm. (120 per oz.); face slightly wrinkled, glossy white; margin rounded, smooth.

Mammoth Chili. Refs. 14, 21, 26, 27, 28, 33, 35, 41, 50, 61, 73, 116, 129, 130. Syns. California Field, California Mammoth, Chili, Chilean Giant, Great Chili, Large Mammoth Chili, Large Yellow Chili, Mammoth Chili Winter, Mammoth Yellow Chili.

The true Mammoth Chili was probably selected from the "Genuine Mammoth" as an earlier and slightly smaller strain. Seed stocks within this group have been undoubtedly interchanged rather freely and today it is rather difficult to find agreement as to the correct type represented by the name Chili. Certainly these large fruited cucurbits have been grown wherever the plant could be cultivated and in many instances have preceded the growing of other varieties of a higher quality. The type was known at the time of the earliest published seed lists.

Mammoth Whale. Refs. 17, 26, 31, 32, 33, 41, 64, 73, 101, 129, 130.

This squash was brought from France and introduced in 1896 by W. Atlee Burpee & Co., Philadelphia.

Although never very popular, it has been kept in trade lists more as a novelty than as a variety of merit.

Mammoth Whale reached maturity at Geneva in 120 days, 5 days earlier than Banana, in season with Winnebago and 5 days later than Hubbard. The vines are more vigorous than those of Banana, have larger, more glossy green leaves and flowers which are distinctly more velvet-like, pubescent, frilled and curved at the margins. The fruits are much larger, more enlarged at the medial and more greenish gray in color.

Plant trailing; vines medium coarse, vigorous, 15-18 feet; branches moderately many, basal. Cotyledons moderately long and very broad, $3\frac{1}{4} \times 2\frac{3}{8}$ inches, oval; apex moderately rounded; color medium green. Leaves very shallowly lobed, medium large, 10 x 15 inches; margin slightly serrated near the base, otherwise denticulate; surface smooth; color medium green, slightly glossy, petiole medium long, 14-16 inches. Flower—pistillate, medium large, $5\frac{1}{2}$ inches across, orange; very soft and velvety, heavily pubescent, margins decidedly curved and crumpled; ovary somewhat cylindrical, enlarged at the medial and slightly tapering towards base and apex; sepals very short and slender, $\frac{1}{4}$ inch;—staminate, moderately small, 4 inches across; petals decidedly curved at the tip, deeply cut, moderately ruffled along the margin; sepals moderately short and moderately slender, $\frac{3}{4}$ inch; pedicle moderately short, 7-8 inches.

Fruit very large, 24-30 x 8-10 inches; weight 18-25 pounds. Shape somewhat cylindrical but much enlarged at the medial and moderately tapering towards base and apex; ribbed widely, furrows very shallow and indistinct; surface usually smooth, occasionally somewhat wrinkled. Blossom scar with button prominent, $\frac{3}{4}$ -1 inch. Skin color greenish gray (storm gray) in the form of an irregular lace-like pattern over the entire fruit, blotched with pale gray (light olive gray) in the areas between the mesh of the color pattern; also marked with gray (storm gray) streaks which radiate from the apex, one-half to two-thirds length of fruit. Fruit stalk medium long, 3-4 inches, round, straight, rough and corky. Shell moderately soft, moderately thick, $\frac{1}{8}$ - $\frac{1}{4}$ inch. Flesh moderately thick at the medial, $1\frac{1}{4}$ - $1\frac{1}{2}$ inches, thick at the base and apex, $1\frac{1}{2}$ -2 inches; texture moderately fine, rather moist, tender, slightly stringy; fair flavor and sweetness; quality fair; color deep yellow (light cadmium). Seed cavity large, conforms to fruit shape; placental tissue abundant, moist, fibrous, not easily removed.

Seed medium large; medium long and moderately broad, medium plump, 1.8 x 1.14 x .30 cm. (124 per oz.); face wrinkled, glossy white; margin very slightly ridged and corky, medial smooth.

Marblehead. Refs. 8, 14, 21, 31, 33, 41, 46, 49, 50, 51, 52, 59, 68, 70, 73, 94, 98, 101, 119, 120, 127, 128, 129, 130, 132, 134. Syns. Improved Marblehead, Marblehead Mammoth, New Marblehead.

Named and introduced in 1873 by James J. H. Gregory & Son of Marblehead, Massachusetts, this variety had been grown for many years in gardens of that section but as the stock was considerably mixed in color it had not been offered for sale. The original had been brought from the West Indies to the old seaport town by a Captain Sam Stanley. According to the story told by Mr. Gregory, some years later, a customer from some remote section sent in seed of an unknown sort. When grown this proved to be a pure strain of the sort discarded as mixed and the name Marblehead was then bestowed upon it. The variety never became popular, perhaps because of its slate gray to blue gray color. At that time the orange of the Autumnal Marrow and Essex Hybrid or the green of

the Hubbard were the colors desired in a good winter squash.

At Geneva 115 days were required to reach maturity. This was 5 days earlier than Blue Hubbard, in season with Hubbard and 5 days later than Delicious. The vines are slightly less vigorous than those of Blue Hubbard, and have darker green foliage. The fruits are smaller, smoother and more nearly globular at the medial than are those of Blue Hubbard, with the flesh thinner and slightly lighter in color.

Plant trailing; vines moderately coarse, moderately vigorous, 12-15 feet; branches moderately many, basal and medial. Cotyledons medium long and moderately broad, $2\frac{1}{2} \times 1\frac{5}{8}$ inches, oval; apex moderately rounded; color medium green. Leaves very shallowly lobed, medium large, 10 x 15 inches; margin slightly serrated near the base, otherwise denticulate, slightly frilled; color moderately dark green; petiole medium long, 14-15 inches. Flower—pistillate, moderately large, 6 inches across, pale yellow; ovary somewhat fusiform, moderately constricted near the base and apex; sepals medium long and moderately slender, $1-1\frac{1}{4}$ inches;—staminate, moderately small, 4 inches across; sepals medium long and moderately thick; pedicle moderately short, 7-8 inches.

Fruit moderately small, 12-14 x 9-10 inches; weight 8-10 pounds. Shape medial nearly globular to short oval, abruptly tapering to a point at the apex and abruptly tapering towards the base; surface shallowly wavy and bumpy. Blossom scar with button $\frac{1}{4}$ - $\frac{1}{2}$ inch. Skin color bluish gray, (court gray) and during storage is replaced by a creamy gray (pale pinkish buff). Fruit stalk moderately short, $2\frac{1}{2}$ -3 inches, round, rough and corky. Shell very hard and thick, $\frac{1}{4}$ inch, pale green (lime green) in color. Flesh medium thick at the medial, 1 inch, and thick at the base and apex, $1\frac{3}{4}$ -2 inches; texture moderately fine, very firm, slightly tough, moderately dry; moderately sweet, fair flavor; quality moderately good; color pale orange (light orange yellow). Seed cavity large, placental tissue moderately abundant, dry, stringy, easily removed.

Seed moderately large; moderately long and medium broad, plump, 2.1 x 1.27 x .50 cm. (84 per oz.); face wrinkled, glossy white; margin rounded, smooth.

Mediterranean. Refs. 14, 130.

A fruit of this variety is illustrated in the 1889 catalog of D. M. Ferry & Co., Detroit, Michigan. It was listed several years earlier by Johnson & Stokes and by Frank Ford & Son, Ravenna, Ohio. While the name Mediterranean was given because it was brought in by a ship captain who made regular trips to that section of the world, it is probable that the specimens were picked up at some New World port of call on the homeward journey.

The fruits of this variety were very much like those of Red China in shape, differing from that variety in being less depressed at the base, thicker, and lacking the prominent crown or acorn ring at the apex common to that variety. The skin color is somewhat more intense red and does not have the stripes of the Red China.

Plant trailing; vines moderately vigorous, 12-15 feet. Leaves nearly entire, margin undulate, very often retuse at the apex, dull grayish green, sometimes blotched with gray, petioles long and slender.

Fruit very small; 5-6 x 7-8 inches. Shape distinctly oblate, slightly depressed at base and apex; ribs and furrows practically absent; surface smooth; skin color deep salmon to scarlet; fruit stalk short and thick, corky, swollen at the medial. Flesh thick, sweet, dry, deep yellow in color.

Middleton Blue. Refs. 127, 134.

When the Hubbard was first cultivated there was also a variety known to James J. H. Gregory & Son as Middleton Blue. This was considered to have come from South America and to have been crossed with Hubbard, the cross giving rise later to the Blue Hubbard. The Middleton was named for a town north of Boston where Gregory grew many of his seeds. Just how the Middleton differed from the Marblehead is not known.

Ohio. Refs. 16, 50, 101, 137. Syns. Autumnal Marrow (Vilmorin), California Marrow.

This name which is found in the 1883 edition of *Les Plantes Potageres* probably refers to a squash similar to Autumnal Marrow. Burr in 1863 mentioned the *Courge d'Ohio* of Vilmorin as a definite synonym of Autumnal Marrow but Goff in 1883 gave them separate descriptions, the chief separatory character being in the pock-marked appearance on the surface of Autumnal or Boston Marrow fruits. This is additional evidence to indicate that there existed several slightly differing forms or strains of this popular variety.

Many fruits of this variety were somewhat like Boston Marrow in shape, although usually more turbinate. The skin color was considerably lighter and the surface lacked the pebbled, pock-marked roughness common to that variety.

Plant trailing; vines slender, pale green, vigorous, 16–20 feet; branches many. Leaves large, very shallowly lobed, deep green; margin sinuate, apex rounded; surface very smooth; petioles long and slender.

Fruit moderately small, 12–14 x 8–9 inches; shape oval to somewhat turbinate, thicker at the base and tapering to the apex; ribbed broad; furrows moderately shallow and narrow; surface smooth. Skin color salmon pink marked with a small greenish area about the button; shell moderately hard. Fruit stalk short and thick, corky and soft. Flesh moderately thick, texture fine, dry, tender, well flavored, color orange; quality good.

Olive. Refs. 14, 48, 49, 50, 101, 137. Syns. French Olive, New Olive.

This is a squash which in shape resembles the fruit of the olive. The variety was listed by W. Atlee Burpee & Co. of Philadelphia in 1884 and by Gregory a year later. It was known to Vilmorin a few years earlier but the actual place of origin is unknown. This variety still carried in European lists was not offered after 1890.

The shape of the fruit was very much like that of the Ohio, being somewhat more slender and definitely more tapered at the base. The skin color was apparently much like that of Black Zucchini summer squash. The leaves were more noticeably lobed than other maxima varieties and apparently had a more definitely tapered terminal lobe.

Plant trailing; vines slender, very vigorous, pale green, leaves large, very shallowly lobed, apex distinctly tapered; margin coarsely undulate, surface very smooth, clear green; petioles long and slender, pale green.

Fruit small, 10–12 x 5–6 inches; weight 6–10 pounds. Shape oval, somewhat pointed at the apex and rounded at the base; surface smooth; skin color dark green, finely mottled and shaded with yellowish green. Flesh moderately thick, very dry, sweet, well flavored, yellow; quality good.

Opass. Syn. Japanese Turban.

The Colorado Seed Co., Denver, Colorado, first listed this variety in 1932, the seed having been secured from a Japanese gardener. The peculiarly striped button or acorn-like blossom end is strikingly similar to fruits shown in a recent Russian publication (22).

The variety matured at Geneva in 120 days, 5 days earlier than Essex Hybrid, in season with Blue Hubbard and 5 days later than Bay State. The vines are slightly less vigorous than those of Bay State with leaves more coarsely blistered and marked with a silvery sheen on the foliage similar to that of Blue Hubbard, and flower petals which are more deeply cut and broadened at the apex than any other variety. The fruits are slightly larger than Bay State and Essex Hybrid, more regular and have a more prominent and regular blossom end scar with very distinct coloration.

Plant trailing; vines medium coarse, moderately vigorous, 12–15 feet, moderately dark green, particularly near the base; branches few, basal. Leaves very shallowly lobed; margin slightly serrated at the base, otherwise denticulate; very slightly frilled; surface moderately smooth, occasionally somewhat coarsely blistered; color moderately dark green, often covered with a light silvery sheen; petiole moderately short, 12–14 inches. Flower — pistillate, medium large, 5–5½ inches across, pale orange, ovary drum-like, pale green, mottled with creamy green; stigma much expanded, often four-lobed; sepals medium long and very slender, 1 inch; — staminate, small, 3½–4 inches, corolla deeply cut, margin frilled, apex of petals broad and tapering towards base as contrasted to tapered petals of most varieties; sepals moderately short and medium thick, ¾–1 inch; pedicle very short, 4–5 inches.

Fruit moderately small, 6–7 x 13–14 inches; weight 15–18 pounds. Shape drum-like, distinctly flattened, depressed at the base and apex; ribbed rather narrowly; furrows moderately deep; surface bumpy, wrinkled, and pock-marked. Acorn very prominent, 5–5½ inches in diameter and has 3–4 projections, streaked with alternating, irregular bands, dull brown (tawny olive) and various shades of cream (cream) and yellow (honey yellow). Skin color covered with a coarse irregular lace-like pattern of dark brownish green (olivaceous black); within the mesh, which varies in diameter from ⅛–½ inch, is salmon red (dragon's blood red). Fruit stalk moderately short, 2½–3 inches, slightly curved, distinctly tapering, rough, soft and corky. Shell moderately hard and thick, ¼ inch. Flesh moderately thick at the base and medial, 1¼–1½ inches, moderately thin at the apex, ¾–1 inch; texture medium fine, slightly fibrous, tender, slightly moist; moderately strong flavor; quality fair; color bright orange yellow (orange buff). Seed cavity large; placental tissue medium amount, moderately dry, rather difficult to remove.

Seed moderately large, moderately long, moderately narrow and moderately plump; face wrinkled, glossy white; margin rounded, smooth.

Possum Nose. Refs. 14, 49, 50.

W. Atlee Burpee & Co. of Philadelphia in 1884 and James J. H. Gregory in 1885 cataloged this small fruited variety. Apparently it had little merit for it was not offered by the introducer after 1892. In the catalog of Wm. Henry Maule of Philadelphia for 1889 is an illustration of Possum Nose which shows a fruit similar to that of Mammoth. This was also described in the catalog of Samuel Wilson, Mechanicville, Pennsylvania, and J. A. Everitt of Indianapolis, Indiana. The description is based on the strain grown at Geneva by Goff.



Two-thirds natural size

MARBLEHEAD



TURKS CAP

(Two-thirds natural size)

Plant trailing; vines moderately slender and vigorous; leaves medium large, often 15 inches broad, very shallowly lobed, margin denticulate, even; color clear green; petioles moderately slender.

Fruit small; 6-7 x 9-10 inches; nearly globular to somewhat oblate, slightly depressed at the base; ribs obscure, furrows very shallow and narrow; surface smooth, occasionally slightly warted or uneven. Fruit stalk moderately short and thick, corky and soft. Skin color pale salmon marked with narrow, lighter, longitudinal stripes. Flesh thick, deep orange.

Quality. Ref. 122.

The name indicates a superior culinary product; and so it is, for the fruits, although rather blunt nosed and homely, are of delicious quality when cooked. The variety was named and first offered in 1914 by Joseph Harris Co., Coldwater, New York. An old customer found this growing in a field of Delicious and selected it for some years before its introduction.

This variety is one of the earliest winter squashes, having matured in 100 days at Geneva, 10 days earlier than Delicious and in season with Boston Marrow. The vines are more vigorous than those of Delicious and, with the exception of having distinctly more ruffled flowers, are similar in other respects. The fruits are considerably broader in proportion to the length than are those of Delicious and by many are thought to be superior in quality.

Plant trailing; vines medium coarse, vigorous, 15-18 feet; branches many, basal and medial. Cotyledons medium long and broad, $2\frac{7}{8}$ x 2 inches; broad oval; apex tapered; color medium green. Leaves medium large, 10 x 16 inches, shallowly lobed; margin denticulate, slightly frilled; color dark green; petiole medium long and moderately heavy, 14-16 inches. Flower—pistillate, medium large, $5\frac{1}{2}$ inches across, lemon yellow; ovary turbinate; sepals moderately short and very slender, $\frac{3}{4}$ inch;—staminate, medium large, 5 inches across, margin distinctly ruffled; sepals medium long and moderately heavy, 1 inch; pedicle moderately short, 7-8 inches.

Fruit small 6-7 x 8-9 inches; weight 5-6 pounds. Shape short broad cordate, depressed at the base, abruptly tapering towards the apex, ribbed widely; furrows moderately shallow; surface somewhat wrinkled, pock-marked. Blossom scar with button $\frac{1}{4}$ inch. Skin color dull green (dull greenish black 2) pock-marked with pale grayish green (court gray to light mineral gray). Fruit stalk moderately short, 2-3 inches, moderately straight, soft and corky. Shell moderately hard and medium thick, $\frac{1}{8}$ inch. Flesh medial and apex medium thick, 1-1 $\frac{1}{4}$ inches, base thick, 1 $\frac{1}{2}$ inches; texture very fine, firm, tender, dry; sweet, excellent flavor; quality excellent; color orange (deep chrome to cadmium yellow). Seed cavity small; placental tissue medium, moderately dry, slightly stringy, moderately easy to remove.

Seed medium large; medium long and moderately narrow, medium plump, 1.9 x 1.0 x .35 cm. (120 per oz.); face finely wrinkled, glossy white; margin slightly rounded, smooth.

Queensland Blue. Refs. 39, 40.

This variety has shown promise when grown in trials at Geneva. Seed was procured from Australia in 1932 and produced vigorous plants with fruits quite different from any maxima found in American lists.

It was one of the latest sorts, having required 140 days to mature at Geneva. This was in season with Crown, 5 days later than Triangle and about 3 weeks later than Hubbard. The vines are much more vigorous than Hubbard, more profusely branched, larger leaved and have lighter yellow flowers with much longer pedicles. The fruits are similar in shape to Bay State, being

more uniformly and deeply furrowed and much thicker, drier and more deeply colored of flesh.

Plant trailing; vines coarse, very vigorous, 20-25 feet; branches very many, basal, medial and apical. Cotyledons medium long and moderately broad, $2\frac{1}{2}$ x $1\frac{1}{4}$ inches; nearly rectangular; apex rounded; veining moderately prominent; color medium green. Leaves moderately large, 11 x 17 inches; very shallowly lobed; margin slightly serrated at the base, otherwise denticulate, moderately frilled; surface moderately smooth; color dark green; petiole long to very long and moderately slender, 18-22 inches. Flower—pistillate, medium large, $5\frac{1}{2}$ inches across, bright lemon yellow; petals moderately erect; ovary drum-like, stigma very compact; sepals moderately short and slender, $\frac{3}{4}$ inch;—staminate, moderately small, $4\frac{1}{2}$ inches across; petals distinctly curved; sepals medium long and medium heavy, 1 inch; pedicle long, 10-12 inches.

Fruit small; 5-6 x 8-9 inches; weight 6-9 pounds. Shape drum-like, sides nearly perpendicular, slightly tapering towards the apex; distinctly depressed at the base, moderately depressed at the apex; ribbed narrowly; furrows medium deep; surface moderately smooth except for the furrow-like depressions. Blossom scar with button $\frac{1}{4}$ - $\frac{1}{2}$ inch, situated in center of moderately large (3 - $3\frac{1}{2}$ inches in diameter), circular, navel. Skin color dull green (dark olive gray to sage green) obscurely mottled with gray (storm gray). Fruit stalk long, 5-6 inches, curved, rough and corky. Shell hard and thin, $\frac{1}{16}$ inch. Flesh thick at the base and medial, 1 $\frac{1}{2}$ -2 inches, medium thick at the apex, 1 inch; texture very fine, very firm and solid, dry; good flavor, moderately sweet; quality very good; color orange (deep chrome to capucine yellow). Seed cavity small towards the apex; placental tissue abundant, moderately dry, rather solid, difficult to remove, particularly from the seeds.

Seed medium size; medium long, moderately broad and moderately plump, 1.76 x 1.17 x .40 cm. (120 per oz.); face smooth, moderately glossy brown (snuff brown); margin very distinct, rounded, smooth (cream buff).

Red China. Refs. 14, 26, 27, 37, 48, 49, 50, 101, 108, 130, 137. Syns. Hong-nan-kona, Japan Red Turban, New Red China, Red Cardinal, Small China Turban, Small Chinese Turban Gourd.

First listed in this country by Tillinghast in 1885 this small oblate squash came originally from China. The Museum of Natural History of Paris introduced the variety to France from whence it came to America. This was at the time when the small pepo types were being replaced by the large fruited and higher quality maximas. After 1896 the name seldom occurred in variety listing.

Although somewhat smaller, the fruits of this variety were similar in shape to those of Queensland Blue, being more rounded at the medial and lacking the truncate shoulder at the base. The acorns are much alike, both usually being depressed slightly and not often protuberant. Nothing in common exists in color of skin since that of Red China most resembled that of the Warren.

Plant trailing; vines rather slender, pale green, moderately vigorous; leaves moderately small, pale green, very shallowly lobed; petioles short and slender, pale green.

Fruit very small; 3-4 x 6-8 inches; weight 2-3 pounds. Shape distinctly oblate, depressed at the base, flattened at the apex; broadly ribbed, furrows moderately shallow; surface occasionally warted; acorn prominent, 2-3 inches in diameter, marked with a corky ring about the periphery, small button present in center; skin color deep orange red, narrowly striped with yellow streaks. The depressed portion within the ring is sometimes green, often variegated with alternate irregular stripes of red, yellow and deep green. Flesh medium thick, fine texture, sweet, orange colored; quality good.

Sibley. Refs. 10, 14, 21, 26, 27, 33, 38, 41, 47, 59, 64, 73, 98, 107, 115, 118, 120, 129, 130. Syns. New Sibley, Pike's Peak.

The Sibley or Pike's Peak squash had a local reputation for many years but until 1887, when it was sent out by Hiram Sibley & Co., Rochester, New York, it was unknown in the trade. According to C. L. Allen it was found in the hands of an elderly lady in Van Dinam, Iowa, who had grown it for 50 or more years in Missouri. F. B. Van Orman of Iowa, a truck gardener, was also interested in its early development. The light brown color of the seed attracted the attention of eastern growers and it is possible that this was the first of the brown-seeded varieties to be cultivated in that section.

Brown-seeded Winnebago is known to have come from an Indian source and Banana, also with brown seeds, is thought to have come from Mexico. The Sibley may then have had its origin from Indian agriculture.

Sibley matured at Geneva in 120 days, in season with Blue Hubbard and 5 days later than Marblehead and Hubbard. Vines are much the same as those of Hubbard but have smaller flowers. The fruits are smoother than those of Marblehead and Blue Hubbard and very similar in color.

Plant trailing; vines medium coarse, moderately vigorous, 12-15 feet; branches moderately many, basal. Cotyledons medium long and broad, $2\frac{5}{8} \times 2\frac{1}{8}$ inches; short oval; apex tapered; veining prominent; color grayish green. Leaves small, 9 x 12 inches, very shallowly lobed; margin slightly serrated near the base, otherwise denticulate, slightly frilled; surface moderately smooth; color moderately dark green; petiole moderately short and moderately slender, 12-14 inches. Flower — pistillate, small, $3\frac{1}{2}$ -4 inches across; yellow ovary somewhat fusiform, slightly curved; sepals short and very slender, $\frac{1}{2}$ inch; — staminate, moderately small, $4\frac{1}{2}$ inches across; sepals moderately short and moderately slender, $\frac{3}{4}$ inch; pedicel moderately short, 7-8 inches.

Fruit moderately small, 10-12 x 8-9 inches; weight 8-10 pounds. Shape obpyriform; ribbed rather narrowly; furrows shallow; surface smooth; blossom scar with button $\frac{1}{2}$ - $\frac{3}{4}$ inch. Skin color bluish gray (court gray) which during storage is replaced with pinkish buff (light ochraceous salmon). Flesh medium thick at medial, 1-1 $\frac{1}{4}$ inches, base and apex slightly thicker; texture very fine, tender, slightly moist; slightly sweet and fair flavor; quality fair; color pale orange (orange buff); seed cavity moderately large; placental tissue abundant, moderately dry, tender, easily removed.

Seed medium large; medium long and broad, moderately plump, 1.87 x 1.06 x .41 cm. (124 per oz.); face smooth, glossy brown (dark fawn 2); margin distinct, slightly ridged, rounded, smooth, light buff (cream buff) in color.

Tree. Refs. 14, 49, 50. Syn. Zapillito Del Trunco.

James J. H. Gregory, Marblehead, Massachusetts, offered this variety in 1885 as a new sort from Brazil. Goff in the New York Agricultural Experiment Station Report for 1887 reports that it is "the only variety of *C. maxima* grown at the Station in which the vine is not distinctly running." This bush maxima has not been offered by the seed trade and the strain grown at Geneva in 1935 came from seed sent from Italy.

Mature fruits of this variety were produced at Geneva in 90 days, the earliest of any maxima variety. This was 10 days earlier than Boston Marrow and

Buttercup. The plants are unlike any other maxima variety in that it is a bush or semi-trailing type. After the crown set of fruit is well developed an occasional trailer is produced. This ordinarily occurs rather late and consequently any fruit which sets never obtains normal size. The mature fruits are much like those of Mediterranean and Red China in shape, and therefore entirely different than any modern sort.

Plant bush, occasionally semi-trailing late in the season; stem short and coarse, rather vigorous grower, not branched; vines when present 4-6 feet long. Cotyledons medium long and moderately broad, $2\frac{1}{2} \times 1\frac{3}{4}$ inches, short oval, apex rounded. Leaves nearly entire, moderately large, 12 x 15 inches; margin denticulate; surface nearly smooth; color medium green; petiole moderately long and heavy, 15-18 inches. Flowers — pistillate medium large, 5-6 inches across, lemon yellow; ovary oblate to somewhat globular, glossy green; sepals very short and thick, $\frac{1}{2}$ inch; — staminate, moderately small, 4-5 inches across; sepals moderately short and very slender, $\frac{3}{4}$ inch; petals on both flowers deeply cut, rounded at the apex, with margins finely frilled and occasionally somewhat recurved.

Fruit very small, 4-4 $\frac{1}{2} \times 6\frac{1}{2}$ -7 inches; weight 4-4 $\frac{1}{2}$ pounds. Shape drum-like, slightly depressed about the stem, moderately depressed about the apex; surface smooth, rather narrowly furrowed; blossom scar with small button, often surrounded with a corky ring. Skin color ivy green later rather bronze green, irregularly striped with dull salmon. Fruit stalk short, 1-2 inches, straight, rather slender, soft and corky. Shell moderately soft and thin. Flesh thin, $\frac{1}{2}$ - $\frac{3}{4}$ inch, thickest at the medial, texture rather coarse, moist; pale orange in color. Seed cavity large, placental tissue chunky.

Seed medium large, medium length, width and thickness, 1.76 x 1.0 x .30 cm. (120 per oz.); face smooth, dull white; margin rounded and smooth.

Triangle. Refs. 39, 40. Syns. Shamrock, Triamble.

In 1932 this variety with Crown and Queensland Blue were secured from Arthur Yates & Co. of Sydney, Australia. They have been described by Darragh in his recent publications and represent the three most common types of Australian pumpkin. When grown at Geneva they showed promise in both growth of plant and fruit and possess characters which may be of value to the plant breeder.

This variety required 135 days to reach maturity at Geneva, 5 days earlier than Queensland Blue and Crown, and 20 days later than Hubbard. The vines are decidedly more vigorous than those of Hubbard, have larger leaves with more prominent auricles, and flowers with more irregular and curved petals. The fruits are unlike any other variety in shape, being trilobular and decidedly thicker fleshed at the base of the lobes; skin color similar to that of Marblehead and Blue Hubbard.

Plant trailing; vines coarse, vigorous, 15-18 feet; branches many, basal and medial. Leaves medium large, 10 x 16 inches, entire, nearly circular; margin denticulate, shallowly undulate; auricles distinctly ascending, often nearly vertically parallel; color moderately dark green, occasionally marked with a silvery gray sheen; petiole moderately slender and long, 18-20 inches. Flower — pistillate, medium large, $5\frac{1}{2}$ inches across, often irregular with petals distinctly curved; stigma very compact, pale orange; ovary 3-lobed, triangular in cross-section; sepals long and slender, $1\frac{3}{4}$ -2 inches; — staminate, moderately small, 4 inches across; sepals medium long and heavy, 1-1 $\frac{1}{4}$ inches; pedicel very long, 15-16 inches.

Fruit small, 4-5 x 10-12 inches; weight 10-15 pounds. Shape trilobular, each locule developing separately, leaving large, deep

furrows between them, arranged in a triangle, base deeply depressed and apex moderately so; surface smooth. Blossom scar with button depressed with a small navel surrounding it. Skin color bluish gray (court gray). Fruit stalk long, 5-6 inches, slightly curved, rough and corky. Shell moderately hard, moderately thin, $\frac{1}{16}$ - $\frac{1}{8}$ inch. Flesh thick to very thick at the base and medial, $1\frac{1}{2}$ - $2\frac{1}{4}$ inches, medium thick at the apex, 1 inch; texture moderately fine, slightly fibrous, somewhat granular, moderately dry; fair flavor and sweetness; quality fair; color pale orange (light cadmium to orange buff). Seed cavity small, conforms to shape of fruit, nearest to apex; placental tissue abundant, stringy, difficult to remove.

Seeds moderately large; moderately long, moderately broad and plump, $2.0 \times 1.34 \times .60$ cm. (84 per oz.); smooth to slightly pitted, glossy brown (snuff brown); margin rounded, smooth, pale buff (cream buff).

Valparaiso. Refs. 1, 14, 21, 24, 26, 27, 42, 44, 48, 50, 65, 92, 101, 102, 124, 130, 137. Syns. Commodore Porter, Commodore Valparaiso, Improved Lima Marrow, Lima Cocanut, Salem Valparaiso, Valparaiso Cheese.

From the name given to this variety its origin may be attributed to South America and probably to Chili. The name is found in variety lists as early as 1857 and it probably was brought to this country by one of the early sailing vessels that made the long trip from New England harbors around the Cape and up the western coast of South America. Commodore Porter, often associated with Valparaiso, undoubtedly was responsible for its introduction. In early reports the name Valparaiso has been associated with various types but the one here described is that given by Burr.

Plant trailing; vines vigorous, 16-20 feet; leaves nearly entire, pale green, often having a grayish metallic appearance; margin denticulate and spiny.

Fruit large, $16-20 \times 12-14$ inches; weight 20-25 pounds. Shape oblong to oval; ribbed broadly, furrowed moderately shallow; style persistent; surface smooth in early stage of growth but upon full maturity is profusely marked with cork-like netting and cracks over the ribs; skin color creamy white slightly tinged with gray. Flesh moderately thick, usually dry, sweet; delicate flavor, orange yellow; quality moderately good.

Victor. Refs. 33, 41, 61, 64, 73, 129, 130.

James J. H. Gregory & Sons, of Marblehead, Massachusetts, first cataloged Victor in 1897. No definite origin is known but, from the nature of the seedlings which were produced during the eight-year period that Gregory selected for uniformity, the parentage was thought to be Turban and Hubbard. Victor fruits are attractive in appearance, and the rich orange yellow, thickly warted, hard, flinty shell is quite unlike other varieties. The fruits are heavy, "handling like solid blocks of oak." Present day stocks seem more oval than the original. The name "Victor" was chosen because of the many first prize ribbons awarded at agricultural exhibits.

Maturity was attained with Victor in 125 days, in season with Essex Hybrid and Banana and 10 days later than Bay State and Hubbard. The plants are more vigorous than those of Essex Hybrid, with the leaves slightly more frilled and the flowers somewhat larger. The fruits are more profusely warted and usually lack the prominent blossom scar protuberance common to Essex Hybrid and Warren.

Plant trailing; vines moderately coarse, vigorous, 15-18 feet; branches moderately many, basal. Cotyledons medium broad and long, $2\frac{3}{4} \times 2$ inches, oval; apex moderately tapering; color medium green. Leaves medium large, 10×15 inches; shallowly lobed; margin denticulate and distinctly frilled; surface moderately smooth, occasionally somewhat crumpled; color moderately dark green; petiole moderately short and moderately heavy, 12-14 inches. Flower — pistillate, moderately large, $6\frac{1}{2}$ -7 inches across, pale orange; distinctly ruffled and frilled with tips decidedly curled; ovary oval to somewhat turbinate, pale yellowish cream, mottled and streaked with pale green; sepals medium long and moderately slender, $1-1\frac{1}{2}$ inches; — staminate, medium large, $5-5\frac{1}{2}$ inches, distinctly ruffled and frilled; sepals medium long and moderately heavy, $1\frac{1}{2}$ inches; pedicle moderately short, 7-8 inches.

Fruit small, $9-10 \times 8-9$ inches; weight 8-10 pounds. Shape nearly globular, depressed at the base and often slightly tapered at the apex; surface abundantly and deeply warted. Blossom scar with button $\frac{1}{2}$ - $\frac{3}{4}$ inch usually present, occasionally marked with a small depressed acorn. Skin color orange to orange red (mars orange to coral red). Fruit stalks medium long, 3-4 inches, curved, rough and corky. Shell hard and thick, $\frac{1}{4}$ inch. Flesh moderately thick at the base, slightly thinner at the apex and medial; texture fine, tender, moderately dry; moderately sweet, slightly insipid; quality fair; color deep yellow to orange (cadmium yellow to deep chrome). Seed cavity medium; placental tissue abundant, often chunky; moist, not easily removed.

Seed medium large; medium long and broad, medium plump, $1.88 \times 1.2 \times .34$ cm. (142 per oz.), face wrinkled, rather dull white; margin rounded, smooth.

Warren. Refs. 26, 28, 33, 41, 59, 61, 64, 73, 96, 117, 129, 130. Syn. Improved Warren.

This variety, which belongs to the turban group, was introduced in 1890 by James J. H. Gregory. The original plant, found by Mr. Warren of Marblehead, Massachusetts, in 1897, in a field of Essex Hybrid, produced three fruits which differed from the Essex in having a deeper orange color, thicker shell and a rougher, more warty appearance. Present stocks of this variety are often considered as an Improved Essex Hybrid for it is possible that the old Essex Hybrid strain no longer exists.

Mature fruits were produced at Geneva in 120 days, 5 days earlier than Essex Hybrid, in season with Blue Hubbard and 5 days later than Bay State. The fruits of this variety are consistently larger than those of Essex Hybrid, and usually have a less prominent blossom scar or acorn.

Plant trailing; vines coarse, very vigorous, 15-18 feet, moderately dark green; branches many, basal and medial. Cotyledons medium long and moderately broad, $2\frac{5}{8} \times 1\frac{3}{4}$ inches, oval; apex tapered; color medium green. Leaves moderately large, 10×18 inches, nearly entire, margin denticulate, slightly frilled; surface coarsely blistered to occasionally somewhat crumpled; color moderately dark green; petiole medium long and medium heavy, 14-16 inches. Flower — pistillate, moderately large, $6-6\frac{1}{2}$ inches across, yellow; ovary somewhat drum-like, pale creamy yellow in color; sepals medium long and moderately slender, 1 inch; — staminate, medium large, $5\frac{1}{2}$ inches across; sepals medium long and medium heavy, 1 inch; pedicle long, 10-12 inches.

Fruit moderately small, $9-10 \times 12-15$ inches; weight 16-20 pounds; shape drum-like, distinctly flattened at the base, sides slightly tapered, somewhat flattened at the apex; surface bumpy and uneven, often profusely warted; acorn prominent, not usually protuberant. Skin color orange red (grenadine red to flame scarlet) with the acorn varying in color from cream to pale salmon pink (pale ochraceous salmon to light ochraceous salmon). Fruit stalk medium long, 3-4 inches, curved, round, rough and corky. Shell

very hard and thick, $\frac{1}{4}$ inch, wood-like. Flesh thick to very thick at the base and shoulders, $1\frac{3}{4}$ – $2\frac{1}{4}$ inches, medial thick and apex thin, $\frac{1}{2}$ – $\frac{3}{4}$ inch; texture medium fine, often rather stringy, moderately dry, moderately tender; fair flavor and sweetness; quality fair; color deep yellowish orange (deep chrome). Seed cavity medium large, having much placental tissue which is moist and rather easily removed.

Seed medium large; medium long, moderately broad, and moderately plump, $1.7 \times 1.1 \times .41$ cm. (112 per oz.); face wrinkled, glossy white; margin rounded and smooth.

Warted Sugar Marrow. Refs. 27, 48, 101. Syns.

Courge Brodee Galense, Warted Marrow, Warted Sugar.

The picture of this squash shown in the 1930 catalog of James J. H. Gregory, Marblehead, Massachusetts, strongly resembles the illustration of the French squash, "Gourge Brodee Galense" shown in *Les Plantes Potageres*. The origin was given as of Bordeaux. Specimens grown at Geneva in 1933 were quite unlike other cucurbits and were strongly "embroidered" "Brodee" as indicated in the French description.

One hundred and thirty days were required for this variety to produce mature fruits at Geneva; this was in season with Etampes and 15 days later than Hubbard. The fruits are similar to Etampes in general shape but entirely distinct from any other variety in surface characteristics.

Plant trailing; vines medium heavy, medium vigor, 8–12 feet; branches many, basal and medial. Leaves small, 9×12 inches; very shallowly five-lobed, margin finely frilled; surface moderately smooth; color moderately dark green. Flower—pistillate, medium large, $5\text{--}5\frac{1}{2}$ inches across, orange; corolla soft, velvet-like, petals distinctly curved and frilled; stigma slightly expanded; ovary globular, somewhat expanded at apex; sepals short and slender, $\frac{1}{2}$ – $\frac{3}{4}$ inch;—staminate, moderately small, $4\frac{1}{2}$ –5 inches across, corolla less heavy; sepals medium large, $\frac{3}{4}$ –1 inch; pedicle short, 4–5 inches.

Fruit moderately small, $7\text{--}8 \times 12\text{--}14$ inches; weight 12–14 pounds. Shape distinctly oblate, depressed at base and apex; ribbed widely; furrowed shallowly; surface exceedingly profusely marked with large, very thick and heavy cork-like warts and cord-like netting over the entire area. Blossom scar very prominent, depressed, and lined about the periphery with a distinct corky ring. Skin color orange (rufous), netting and warts gray (vinnaceous buff). Shell hard and medium thick, $\frac{1}{8}$ inch. Flesh moderately thick, $1\frac{1}{4}$ inches, thicker near the base; texture moderately fine, medium dry, tender; fair flavor, slightly sweet, color deep yellow (capucine yellow); quality fair.

Seed medium large; medium long, moderately broad and medium plump, $1.84 \times 1.3 \times .30$ cm. (124 per oz.); face moderately smooth, pale buff (tulle buff); margin rounded and smooth, white.

White Chestnut. Refs. 14, 26, 27, 64, 110, 130. Syns. Chestnut, White Hubbard.

James J. H. Gregory & Sons of Marblehead, Massachusetts, who introduced this in 1890, wrote in the *Rural New Yorker* of 1898 that it had been introduced from semi-tropical regions. It was called "white" because it was the lightest in color of the hard shelled squash and "chestnut" because it cooked "dry as a boiled chestnut."

Due to the widespread popularity of the Hubbard a number of varieties were introduced which were similar in many respects to that well known sort. White Chestnut was about the same size and shape of the

original Hubbard. It differed from that variety in having a creamy white skin, much lighter than Marblehead, and a lighter, more lemon yellow flesh, which was fine in texture, dry, sweet, and of good quality.

Wilder. Refs. 24, 44. Syn. Stetson Hybrid.

Sometime about 1855 the Wilder squash was produced by A. W. Stetson of Braintree, Massachusetts, as the result of a cross between Valparaiso and Autumnal Marrow. The name Wilder comes from the Hon. Marshall P. Wilder, one of the leading horticulturists of his time. For some reason the variety never was widely grown, possibly because the good qualities of the winter squash group were little known.

The fruits were usually similar in shape to Olive, although often irregular. The skin color was similar to that of Autumnal Marrow but the surface apparently lacked the pebbled, pock-mark irregularities common to that variety. The flesh was more salmon tinted and apparently was inferior to Autumnal Marrow and Hubbard as a baking variety, but admirably adapted for pies.

Plant trailing; vines vigorous.

Fruit medium large, 12–30 pounds. Shape oval, but often rather irregular; ribbed broadly; furrowed shallowly, often obscurely; style persistent. Fruit stalk curved, large, corky; skin color reddish yellow, similar to that of Autumnal Marrow. Flesh thick, sweet, well flavored, salmon yellow in color.

Seeds white.

Winnebago. Refs. 33, 40, 41, 73, 129.

This is another of the squash collected by Dr. M. R. Gilmore of the Museum of Anthropology of the University of Michigan. It was introduced in 1921 by Oscar H. Will & Co. of Bismarck, North Dakota. The Winnebago Indians of Nebraska had the original seed which was given by them to Dr. Gilmore. Of rather unusual shape, like an elongated Hubbard, it has many of the qualities of that standard variety.

Winnebago reached maturity at Geneva in 120 days, 5 days earlier than Banana, in season with Mammoth Whale, and 5 days later than Hubbard. The vines are less vigorous than those of Banana, and have slightly larger leaves and lighter yellow flowers which are more frilled. The fruits are slightly longer than those of Banana and have a much rougher surface and a darker skin color.

Plant trailing; vines rather coarse, moderately vigorous, 10–12 feet; branches moderately few, basal. Cotyledons medium long and very broad, $2\frac{3}{4} \times 2\frac{3}{8}$ inches; short oval to nearly round; apex tapered; color medium green. Leaves medium large, 10×15 inches, very shallowly lobed; margin denticulate, very slightly frilled; surface moderately smooth; color medium green; petiole moderately short, 12–14 inches. Flower—pistillate, moderately large, 6 inches across, lemon yellow, margins frilled, ovary long fusiform; sepals short and very slender, $\frac{1}{2}$ inch;—staminate, moderately small, $4\text{--}4\frac{1}{2}$ inches; margin frilled; sepals short and moderately slender, $\frac{3}{4}$ inch; heavily pubescent; pedicle very short, $3\frac{1}{2}$ –4 inches.

Fruit medium large, $20\text{--}24 \times 7\text{--}8$ inches; weight 12–16 pounds. Shape elongated, somewhat cylindrical; tapering gradually to the base and rather abruptly towards the apex; surface wrinkled, irregularly ridged and somewhat warty and uneven. Blossom scar with button long, $1\text{--}1\frac{1}{2}$ inches. Skin color dull green (dull greenish black) marked with gray (court gray) stripes which radiate



(Two-thirds natural size)

WARREN



ENGLISH VEGETABLE MARROW

(Two-thirds natural size)

from the apex three-quarters length of fruit, and small irregular blotches of the same color; during storage the stripes and blotches change to pale pink (light congo pink) and the green to bronze gray (light drab). Fruit stalk moderately short, $2\frac{1}{2}$ –3 inches, moderately straight, rough and corky. Shell moderately hard, thick, $\frac{1}{4}$ – $\frac{3}{8}$ inch. Flesh moderately thin at the apex and medial, $\frac{3}{4}$ –1 inch; base moderately thick, $1\frac{1}{4}$ inches; texture very fine, tender, moderately dry; fair flavor, slightly sweet; quality fair to moderately good; color pale orange (orange buff to apricot yellow). Seed cavity large, conforms to shape of fruit; placental tissue medium amount, moist, tender, rather difficult to remove.

Seed large; long, narrow and plump, $2.3 \times 1.2 \times .55$ cm. (72 per oz.); face cracked and pitted, brown (snuff brown); margin ridged, slightly corky, between ridges smooth, pale buff (cartridge buff).

CUCURBITA PEPO

Varieties of this species were in common use among the Indians at the time of our early colonization. At that time the prototypes of our present day varieties, Bush Scallop, Perfect Gem and Connecticut Field, were known and recorded by early writers. In 1806 McMahon recorded the existence of many sorts, but mentioned no variety names, although his warted squash, listed as *Cucurbita verrucosa*, may have been a summer crookneck. The vegetable marrow first appeared in catalogs in 1824 when Thorburn listed it. In 1847 Apple was introduced by Hovey, and Patagonian by Thorburn, while Para and Custard did not appear in catalog lists until about 10 years later. Records during the period 1825 to 1860 are rather incomplete, consequently it is not known just when such varieties as Nantucket, Small Sugar, Bergen and Variegated Bush Scallop appeared. Since Burr, in 1863, included these in his "Field and Garden Vegetables of America" they were, obviously, accepted as distinct sorts at or before this time.

As in the case of varietal development of the maximas, the greatest activity in pepo introductions was shown from 1880 to 1900. During this period Fordhook, Perfect Gem, Pineapple and Delicata were among the small fall squashes introduced. The large-fruited winter pumpkins such as Winter Luxury, Golden Oblong, Gibson and Dunkard were all listed for the first time between 1890 and 1900. At the same time a considerable advance in the development and introduction of summer squash was made, as evidenced by the fact that Earliest Prolific, Mammoth White Bush Scallop, Long Island White Bush Scallop and Giant Summer Straightneck were first introduced. The past 30 years have seen the introduction of Table Queen in 1913 Boston Greek in 1918, and Zucchini in 1921. During this period three Indian varieties from the northern plains region were named and introduced as Mandan, Fort Berthold and Omaha, thereby emphasizing the fact that the species had long been known by the early Americans.

The greatest diversity in fruit and plants of the three species discussed in this chapter occurs within the pepos. In size they range from the apple-like Perfect Gem to the mammoth Tours and Sandwich Island, while fully as great a divergence exists in plants, as shown by the bush-like habit of the scallops and the exceedingly

coarse, vigorous growth of the aforementioned mammoth varieties. The great variety of colors and color patterns have also contributed to the interest of the group.

The utility of the pepos has been and still is rather varied. Early records do not make a very clear distinction between some of these and the gourds, but the Indians are said to have used the dried shell of the warted summer crookneck as a rattle during their ceremonial dances; and certain varieties such as Cocoanut and Illinois Beauty, in addition to their usefulness as food, often served as colorful ornaments during the latter part of the nineteenth century much as the ornamental gourds are used today. From the standpoint of food use, all varieties can be listed in one of four groups: First, the so-called summer squashes (including the various scalloped sorts, the vegetable marrows and the warted crooknecks), which are used in the immature stages; second, the fall squash or individual group (including Black Michigan, Delicata and Table Queen), which produce firmer flesh than the preceding group and are much esteemed for baking in the half-shell; third, the winter pumpkins which are grown for storage and largely used for pies (including Winter Luxury, Small Sugar, Golden Oblong and Connecticut Field, the latter two often used in blending with the stiffer squash varieties in the manufacture of pie stock); and last, and least desirable, those varieties sometimes grown for stock food, among which are Sandwich Isle and Tours.

Sixty varieties are treated in more or less detail in this analysis. No attempt has been made to include the many English types of vegetable marrows, nor has it been possible to consider other foreign types unless they were introduced into the trade channels of our seed industry.

Alexandria. Ref. 130.

This variety originated sometime prior to 1902 with F. B. Van Ornam who was supposed to have secured the seed from Alexandria, Egypt. The fruits were shaped similar to those of Fordhook without the ridges and furrows. It was about the same size, very smooth and hard shelled. It was dropped from trade lists 4 or 5 years later.

Apple. Ref. 24. Syn. Early Apple.

Hovey & Co. of Boston, Massachusetts, listed this unusual squash variety from 1847 to 1857. Burr in 1863 describes the fruit as obtusely conical, three inches broad at the stem and two and a half in depth. The skin yellowish white, tender while the fruit is young, but shell-like when ripe. This, the smallest fruited squash recorded in early lists, may have been the precursor of Perfect Gem, a popular sort forty to fifty years later.

Black Michigan. Refs. 11, 30, 59, 69, 97, 130. Syns. Iron Clad, Para, Polk.

The Vaughan Seed Store, Chicago, Illinois, listed and illustrated in their catalog of 1905 this distinct fall and winter variety. According to the information describing the new novelty, seed had been procured from a gardener in New Haven, Connecticut, who had

grown it successfully for many years. Specimens grown in 1935 from seed taken from a squash sent here by a Connecticut seedsman produced fruit like the picture in the catalog and also in the booklet "Squashes and How to Grow Them," etc. published by Gregory in 1893 under the names Para and Polk Squash. In 1859 the name Polk is listed in the catalog of Hovey & Co. of Boston. The name Para is of South American origin but the variety was seemingly never very widely grown.

The fruits of this variety are most like those of Illinois Beauty in shape but are less tapered at the base. The uniformly greenish black skin serves to further distinguish it from this variety and Delicata. The plants are very slow growers and less vigorous than those of Delicata, also lack the silvery sheen leaf characteristic of the latter variety.

Plant trailing; vines moderately slender, weak grower, 5-6 feet; branches moderately few; semi-bush in early stages, later become trailing. Leaves broadly 5-lobed, sinuses deep and narrow.

Fruit very small, 10-12 x 3-3½ inches; weight 2-2½ pounds; shape oblong, cylindrical, apex full, base slightly depressed; ribbed moderately narrow; furrows shallow; surface rather uneven, slightly bumpy; skin color dark green over entire surface with the exception of area adjacent to ground which is orange (salmon orange). Fruit stalk short, 1½-2 inches, moderately slender, shallowly furrowed, hard and woody, expanded at the base. Shell very thin, ⅛-⅓ inch, indefinite, firm. Flesh moderately thin, ¾-7⁄8 inch, slightly thicker at the base, very firm texture, moderately dry, sweet, well flavored, pale orange (orange buff); quality good.

Seed small; short, broad and flat, 1.15 x .75 x .18 cm. (460 per oz.); surface moderately smooth, light buff; margin wedge-like, slightly curved and twisted.

Black Zucchini. Ref. 86. Syns. Green Bush Tripoli, Long Dark Green Bush Marrow Tripoli, Wesley's Cocozelle.

This dark skinned variety has only within the last few years become popular on the West Coast and on certain markets in the east. It was listed in 1931 by the Jerome B. Rice Seed Co., Cambridge, New York, by Alexander Forbes & Co., Newark, New Jersey, and others in 1933. The stocks as offered by these seed houses are somewhat different in shape.

First edible fruits were produced at Geneva in 58 days, 5 days later than Zucchini and 3 days later than Italian Vegetable Marrow. The plants are more vigorous than those of Zucchini with the leaves slightly larger, slightly less finely parted and decidedly darker green. The fruits are much longer and more slender, and have a distinctly darker, more uniformly colored skin.

Another sort bearing the name Rice's Black Zucchini is entirely distinct from the one considered in detail in this account. Mature edible fruits are obtained 5 days earlier and are much thicker in proportion to their length. The foliage is decidedly less cleft, being very similar in outline to those of White Bush Scallop.

Plant bush; central stem moderately coarse, very dark green; branches moderately few, basal; moderately vigorous. Cotyledons medium long and moderately broad, 2¾ x 1½ inches; oval; apex tapered; color dark green. Leaves small, 10 x 12 inches, rather narrowly 7-lobed, each lobe having many sub-sinuses; sinus rounded at the base, somewhat lacerated; margin incised near the base of the blade, otherwise serrated; color dark green; petiole medium long and moderately slender, 15-16 inches. Flower—pistillate, medium

large, 5-6 inches across, orange; ovary cylindrical, very symmetrical; sepals very short and slender, ¼ inch;—staminate, moderately small, 4-5 inches across; sepals medium long and moderately heavy, 1 inch; pedicel very short, 4-5 inches.

Fruit mature edible stage 15-18 inches long, 2¼-3¼ inches in diameter at the base and 2¾-3¾ inches at the apex; shape nearly cylindrical, slightly curved and very slightly enlarged at the apex; ridged slightly at the base; surface smooth; blossom scar with small button, ¼ inch. Skin color very dark green, almost black (dull greenish black) obscurely speckled and finely mottled with pale greenish yellow (light dull green yellow). Interior pale greenish white (pale glass green). Mature fruit moderately small, 22-26 inches long, 3¼-4½ inches in diameter at the apex and 3½-3¾ inches at the base; weight 7-9 pounds. Shape much the same when mature edible. Skin color uniformly and finely laced with dark green (dull blackish green), concentrated at the ridges to form a very dense, nearly solid, narrow stripe of the same color; ground color which appears within the mesh of the lace-like color pattern is pale orange yellow (light cadmium). Fruit stalk very short, ¾ inch, deeply ridged and distinctly expanded at the point of attachment. Shell moderately hard and thin, ⅛ inch, greenish yellow (glass green). Flesh coarse, granular and soft, moderately thin, ¾ inch, pale buff yellow (maize yellow).

Seed moderately small; moderately short, medium broad and moderately plump; 1.49 x .77 x .28 cm. (260 per oz.); face smooth, dull white, (pale olive buff), margin wedge-like.

Boston Greek. Ref. 86.

This is a summer bush squash which was introduced from Southern Europe in 1918 by Joseph Breck & Sons of Boston, Massachusetts, who listed it upon recommendation of friends. It is grown to a limited extent near eastern markets. It is believed by many to be superior in quality to others in its class and when cooked it assumes a more delicate and attractive green color.

First edible fruits were produced at Geneva in 52 days, 1 day earlier than Zucchini and 2 days later than Earliest Prolific. The plants are more vigorous than those of Zucchini, with distinctly lighter green stalks and slightly larger leaves which are darker green in color and decidedly less blotched with gray. The fruits are distinctly lighter green in color, but otherwise are much like those of Zucchini in shape.

Plant bush; central stem moderately heavy, light green; branches many, basal; spread 4 feet, vigorous. Cotyledons moderately short and moderately narrow, 2⅝ x 1⅝ inches; oval; apex moderately rounded; color dark green. Leaves moderately small, 12 x 12 inches; rather narrowly 5 to 7-lobed, each lobe having many sub-sinuses; sinuses rounded at the base, rather narrow, lacerated; margin slightly incised near the base of the blade, otherwise serrate; surface moderately smooth; color dull dark green; petiole medium long and slender, 14-15 inches. Flower—pistillate, moderately large, 6½ inches across, orange; ovary cylindrical; sepals very short and slender, ¼ inch;—staminate, moderately large, 6 inches across; sepals medium long and heavy, 1¼ inches; pedicel moderately short, 7-8 inches.

Fruit mature edible stage 10-12 inches long, 3½-4 inches in diameter at the apex and 3-3¼ inches at the base; shape somewhat cylindrical, gradually enlarging towards the apex; ribbed slightly at the base; surface smooth. Blossom scar with button very small. Skin color effect light green; ground color pale yellow (sea foam yellow to margarite yellow) profusely marked with a moderately light green (light bice green) lace-like color pattern over the entire fruit. Interior pale greenish white (pale glass green). Mature fruit small, 12-14 inches long, 4¼-4½ inches in diameter at the apex and 3½-3¾ inches at the base; weight 4-4½ pounds. Shape much the same when mature edible. Skin color uniformly and finely laced with a pale orange yellow (orange buff) lace-like color pattern; ground color pale cream (Naples yellow). Fruit stalk short, 1¾-2

inches, deeply ridged and distinctly expanded at the point of attachment. Shell hard, brittle and thin, $\frac{1}{16}$ inch, somewhat thicker at the base; pale yellow (straw yellow). Flesh very coarse, granular and soft; moderately thin, $\frac{3}{4}$ –1 inch, pale creamy yellow (straw yellow).

Seed moderately small; moderately short, medium broad and medium plump, 1.46 x .79 x .34 cm. (248 per oz.); face smooth, dull white (cartridge buff); margin wedge-like, nearly smooth.

Brazilian Sugar. Refs. 14, 26, 31, 48, 50, 64, 101, 121, 130, 137. Syns. Brazil Sugar, Brazilian, Brazilian Sugar Gourd.

As a novelty this was offered in 1885 by W. Atlee Burpee & Co., Philadelphia, but had little success as a commercial variety. It was discontinued in 1904. The fruits of this variety are most like those of Der Wing in shape, differing from that variety in being larger and orange yellow in color instead of white.

Plant trailing; vines slender, pale green, vigorous; branches many, basal and medial. Leaves 5-lobed, very dark green; surface distinctly blistered and crumpled; margin finely dentate; petiole moderately short and slender, pale green.

Fruit very small; 5–6 x 4–5 inches; weight 2–3 pounds. Shape oval; ribbed obscurely; furrows very shallow, irregular, more prominent at extreme base; surface profusely warted; skin color pale yellow turning deep orange at full maturity; fruit stalk moderately short, slender, grooved and somewhat tapered; shell very hard and thick, woody. Flesh thick, very sweet, yellow.

Cocoanut. Refs. 12, 14, 21, 24, 26, 31, 34, 37, 46, 47, 49, 50, 56, 59, 61, 64, 82, 118, 120, 130, 132. Syns. Cocoa-nut, Little Cocoanut, Small Cocoanut.

This was one of the most popular small fruited squash listed. It was offered by James J. H. Gregory & Sons, Marblehead, Massachusetts, in 1869 and was compared in flavor to the Canada Crookneck. The fruits were quite handsome and often were used like a gourd as a mantel decoration. The variety outlasted most of the other small fruited sorts and was cataloged by Gregory until 1923.

At Geneva this variety reached edible maturity in 90 days, which was 4 days later than Table Queen, 10 days later than Delicata and 6 days earlier than Black Michigan. The fruits are unlike any other individual fall squash, having a distinct shape and color pattern. Some of the fruits are similar in shape to Table Queen, but the accepted type is much less furrowed and more globular.

Plant trailing; vines very dark green at the base, coarse, vigorous, 6–8 feet, moderately branched at the base. Leaves moderately small, 10 x 13 inches, broadly 5-cleft, with terminal lobe having two pair of sub-sinuses; sinuses deep, acute, very narrow; margin incised near the base, otherwise serrated, finely frilled; surface profusely and coarsely blistered, distinctly dark glossy green; petioles very short and medium heavy, 7–9 inches.

Fruit very small, 6–7 x 5–6 inches; weight $2\frac{1}{2}$ –3 pounds. Shape nearly globular to cordate, depressed at the base; ribbed widely; furrows moderately deep and broad; surface smooth except for the longitudinal ridges; skin color yellow (light orange yellow) along the ribs and orange (mikado orange) irregularly striped, extreme apical area bright green (cress green), circular in outline, very definite. Fruit stalk short, curved, furrowed, woody and tough. Shell soft and thick, $\frac{1}{4}$ – $\frac{1}{2}$ inch. Flesh $\frac{3}{4}$ –1 inch, thick for the size of fruit, fine texture, moderately dry, tender, fair flavor, moderately sweet, pale orange (light orange yellow); quality moderately good.

Seed small; short, broad and flat, 1.2 x .84 x .20 cm. (336 per oz.); face smooth, pale buff (pale ochraceous salmon); margin wedge-like.

Cocozelle. Refs. 26, 27, 31, 33, 41, 47, 62, 73, 86, 89, 95, 117, 129, 130. Syns. Cocozella, Cocozella di Napoli, Cocozelle Bush.

This name is used to represent one of the most popular of the Italian Marrows. The Associated Seed Growers, New Haven, Connecticut, offered in 1934 a Long Cocozelle and a Short Cocozelle, both strains finding adherents in certain markets. The type is a true bush squash in which respect it differs slightly from the Italian Vegetable Marrow which was the first name used for any variety in the group.

The variety is very similar to Italian Vegetable Marrow and differs from that variety in having smaller, more slender fruits which are much less ridged at the base, more prominently striped with greater contrasting colors and borne on plants which are much less vigorous. Two strains, Short Cocozelle and Long Cocozelle, are grown. These differ only in the length of fruits produced. The following account refers to the short strain.

Plant bush; central stem moderately coarse, short and moderately vigorous; branches few, basal and medial. Leaves moderately small, 11 x 13 inches, broadly 5-cleft; sinuses narrow and acute; margin dentate, slightly incised near the base; color dark dull green, occasionally some plants sparsely blotched with gray. Flower—pistillate, large, 7 inches across, orange; ovary cylindrical; sepals very short, $\frac{1}{4}$ inch;—staminate, large, 7–8 inches across; sepals medium long and moderately heavy, 1 inch; pedicle moderately short, 7–8 inches.

Fruit mature edible stage very small, 10–12 x $3\frac{1}{2}$ –4 inches, nearly cylindrical, very slightly enlarged at the apex, ribbed widely and very shallowly, most prominent at base; surface smooth. Skin color alternately striped in rather definite lines with very dark green (dull greenish black) and pale greenish yellow (barium yellow) both of which appear as a fine lace-like pattern. Mature fruits considerably larger, 16–18 inches long, 4–5 $\frac{1}{2}$ inches in diameter at the tip and 3 $\frac{3}{4}$ –4 inches at the base; shape the same; skin color practically the same dark green shade, but the lighter shade changed to yellow (cadmium yellow) and the ground color to pale yellow (margarite yellow).

Connecticut Field. Refs. 14, 19, 21, 24, 27, 28, 31, 32, 33, 41, 42, 50, 59, 64, 73, 121, 129, 130. Syns. Big Tom, Cannors Supreme, Common Field, Common Yellow, Connecticut Cornfield, Connecticut Golden Field, Connecticut Yellow Field, Cow, Eastern Field, Georgia Field, Golden Marrow, Indiana Field, Jack O'Lantern, Lake Shore, Large Common Field, Large Connecticut Field, Large Connecticut Yellow Field, Large Cornfield, Large Field, Large Yellow, Mammoth Field, Michigan Mammoth, Pure Gold, Southern Field, Vermont Pumpkin, Western Field, Yankee, Yankee Field, Yankee Pie.

The common field pumpkin in New England can be traced back traditionally to the early settlements. Field and pie pumpkins and a form of summer squash and Cushaws were the first of the cucurbits grown on our farms or in our kitchen gardens. For over 200 years the pumpkin occupied the principal place in the variety lists of this vegetable and the group described by Burr

represented forms which had been segregated into separate varieties. Of the larger forms Burr mentioned four: Canada, Common Yellow, Connecticut Field and Long Yellow. Records are not available as to how, when and where these separate forms may have arisen. Today Connecticut Field is the chief representative of the group and is the variety grown on the majority of farms which have use for this vegetable.

Mature fruits of this variety were obtained at Geneva in 120 days, in season with Golden Oblong and 20 days later than Small Sugar. The vines are similar in most characters to Golden Oblong but have flowers with ovaries more nearly globular. The fruits are similar in color, but those of Connecticut Field are more globular and have flesh which is lighter in color and more moist.

Plant trailing; vines medium heavy, moderately vigorous, 12-15 feet; branches moderately many, basal. Cotyledons medium long and moderately broad, $2\frac{3}{4} \times 1\frac{3}{4}$ inches; long oval; apex moderately rounded; color medium green. Leaves moderately large, 12 x 15 inches; broadly 5-lobed, terminal lobe having a few sub-sinuses; sinuses moderately shallow, narrow and rounded at the base; margin serrated, slightly incised near the base; surface moderately smooth, occasionally somewhat crumpled; color moderately dark green; petiole medium long and heavy, 15-16 inches. Flower—pistillate, moderately large, $6\frac{1}{2}$ -7 inches across, light orange; ovary globular to short cylindrical; sepals very short and moderately slender, $\frac{1}{4}$ inch;—staminate, moderately large, 6 inches across; sepals medium long and moderately heavy, 1 inch; pedicel moderately long, 9-10 inches.

Fruit moderately large, 10-18 x 10-14 inches, weight 18-25 pounds. Shape variable, some nearly globular, slightly depressed at base and apex and others long oval, more or less rounded or full at base and apex; ribbed rather narrowly; furrows moderately shallow; surface smooth. Blossom scar prominent, 1-1 $\frac{3}{4}$ inches in diameter. Skin color (ochraceous orange to xanthine orange). Fruit stalk medium long, 3-4 inches, slightly curved, rough, ridged, woody and tough, somewhat expanded at attachment. Shell moderately soft and medium thick, $\frac{1}{8}$ - $\frac{3}{16}$ inch. Flesh thick at the medial and base, 1 $\frac{1}{2}$ -2 inches, moderately thick at the apex, 1 $\frac{1}{4}$ -1 $\frac{1}{2}$ inches; texture rather coarse, somewhat granular, soft, moist, moderately fibrous; slight flavor and sweetness; quality poor; color pale cream (warm buff to buff yellow). Seed cavity large, placental tissue moderately abundant, somewhat stringy, easily removed.

Seed moderately large; moderately long, moderately narrow and medium plump, 2.00 x 1.10 x .30 cm. (128 per oz.); face smooth, dull white (ivory yellow); margin wedge-like.

Custard. Refs. 24, 44, 59, 125. Syn. Banana.

This variety with rather coarse appearing fruits was one of the earliest cultivated forms grown in this country. It had its counterpart in Europe in Patagonian, similar in shape but with a green color. Described by Burr in 1863 and mentioned by Harris in 1856, it was one of the kinds grown in earlier times for pies and later, after the introduction of those of better quality, relegated to the group grown only for feeding stock. The name can be traced in catalogs until the turn into the 20th century.

The variety is practically identical to that of Sandwich Island except in color of skin, the latter being profusely marked with a coarsely interlaced green color pattern which is emphasized particularly in the longitudinal stripes.

Plant trailing; vines coarse, very vigorous, 20-25 feet. Fruit large, 18-20 x 8-10 inches; weight 18-25 pounds. Shape oblong, depressed at base and apex; ribs many, broad, very prominent,

furrows deep and moderately wide, most irregular at the base; fruit stalk large, slightly curved, deeply furrowed, hard and woody. Shell soft; skin creamy-white. Flesh thick, coarse texture, soft, fair flavor; pale yellow. Seed long and narrow, yellowish white.

Dauphine Early Bush. Refs. 61, 97. Syns. Early Dauphine, New Bush.

An illustration of this variety is shown in the catalog of James J. H. Gregory & Son for 1906. While this may have been quite similar to Geneva Bush the description given shows the fruit to be larger and oblong rather than oblate. The possible use of this variety was in the home garden where a few hills could have been grown on a small area.

Delicata. Refs. 17, 27, 30, 31, 32, 33, 41, 46, 47, 61, 64, 73, 87, 95, 120, 121, 129, 130. Syns. Bohemian, Sweet Potato, Ward's Individual.

Delicata, probably named for the delicate coloring of the fruits or for the richness of flavor, was introduced in 1894 as the earliest of the vine squash. Peter Henderson & Co., New York, featured it for several years after its first introduction, but its popularity waned with the decline in use of this entire group.

Eighty days were required for this variety to attain maturity at Geneva. This was about 6 days earlier than Table Queen and Fordhook and 10 days earlier than Black Michigan. The vines are less vigorous than those of Table Queen, and have smaller leaves which are considerably less deeply lobed and more distinctly silvery green in color. The flowers are slightly smaller and have distinctly smaller and more slender sepals on the pistillate inflorescences. The fruits are similar in shape to those of Black Michigan but are shorter, slightly more plump, and distinctly different in color.

Plant trailing; vines moderately slender, medium vigor, 8-10 feet; branches many, basal and medial. Cotyledons very short and narrow, $1\frac{1}{2} \times 1\frac{1}{8}$ inches; nearly round; apex rounded; veining prominent; color moderately light green. Leaves small, 7 x 8 inches, shallowly 5-lobed, sinus acute; margin denticulate; surface smooth to somewhat blistered; color silvery green; petiole short and slender, 10-12 inches. Flower—pistillate, moderately small, $4\frac{1}{2}$ inches across; orange; ovary nearly cylindrical, slightly constricted at the medial, slightly ridged and channeled; sepals very short and slender, $\frac{1}{4}$ inch;—staminate, medium large, 5 inches across; sepals moderately short and moderately slender, $\frac{3}{4}$ inch. Pedicel short, 5-6 inches.

Fruit very small, 8-10 x $3\frac{1}{2}$ -4 inches; weight 2-3 pounds. Shape cylindrical, ribbed narrowly; furrows broad and shallow; surface slightly wrinkled. Blossom scar with button $\frac{1}{4}$ - $\frac{1}{2}$ inch long. Skin color light cream (cartridge buff) streaked and blotched with green (dark cress green) along the furrows; during storage the green pattern is replaced with orange (ochraceous orange) although the ground color (cartridge buff) remains practically the same. Fruit stalk short, 1-2 inches, slender, usually straight, slightly ridged, slightly expanded at attachment and very easily detached. Shell moderately hard and medium thick, $\frac{1}{8}$ inch. Flesh moderately thin, $\frac{3}{4}$ -1 inch; texture very fine, tender, crisp, moderately dry; sweet, good flavor; quality good; color deep orange yellow (capucine yellow to orange buff). Seed cavity moderately small, conforms to fruit shape; placental tissue moderately abundant, rather moist, tender, easily removed.

Seed small; short, broad and moderately flat; 1.24 x .86 x .25 cm. (300 per oz.); face smooth, often slightly curled or twisted, dull brownish yellow (light buff); margin wedge-like.

Der Wing. Refs. 16, 25, 26, 27, 47, 64, 95, 115, 118, 130.

This and Red China are the only squash varieties definitely ascribed to Chinese origin. W. Atlee Burpee & Co., Philadelphia, received seed of this along with other plant material from a native Chinese collector acting for them. It is distinct and was considered of good quality, but its small size and queer looks proved too great a handicap.

The fruits are most like Brazilian Sugar in shape, differing from that variety in being smaller and having white skin.

Plant trailing, medium vigor.

Fruit very small; 5-6 x 2½-3 inches; shape oval, somewhat pointed at apex; surface profusely warted; skin color white. Shell thick, very hard and woody. Flesh moderately thick, very sweet when cooked, very light yellow, often with a greenish tinge.

Dunkard. Refs. 14, 130. Syn. Dunkard Winter.

This variety originated with the Dunkards in Bucks County, Pennsylvania. Seeds were offered for sale in 1892 by Johnson & Stokes of Philadelphia, and Frank Ford & Son of Ravenna, Ohio. The outstanding characteristic stressed in early descriptions was their great keeping qualities, specimens having remained in perfect condition for two years. The fruit, oblong in shape, frequently reached a weight of from twenty to twenty-five pounds. The outside skin color was a deep orange lightly striped. A good illustration can be found in the 1896 catalog of W. Atlee Burpee & Co., which concern offered the variety until 1912.

Earliest Prolific. Ref. 130. Syns. Extra Early Prolific, Prolific Early White Bush, Wood's Prolific.

This early strain of the green tinted scalloped summer squash has been offered since 1899 by T. W. Woods & Sons, Richmond, Virginia. The fruits are borne in great profusion and when continuously harvested will produce fruits throughout the season.

First edible fruits were produced at Geneva in 50 days, 4 days earlier than Long Island White Bush and 6 days earlier than White Bush Scallop. The plants are not as vigorous as those of White Bush Scallop, although somewhat more inclined to produce semi-runners. The leaves are considerably smaller and less blistered, and the flowers are slightly smaller, particularly the staminate ones. The fruits are smaller, decidedly less scalloped, and more uniformly and heavily tinted with green.

Plant bush; central stem moderately coarse, vigorous, branches very few, basal. Cotyledons short and moderately narrow, 1¾ x 1¼ inches; nearly round; apex rounded; veining prominent; color moderately light grayish green. Leaves small, 9 x 11 inches, shallowly 5-lobed; lobes broad, pointed; sinus shallow, acute and very narrow; margin incised near the base, otherwise serrate; surface smooth; color medium green; petiole moderately long and medium heavy, 16-18 inches. Flower — pistillate, medium large, 5½ inches across, pale orange; ovary disk-like, thick; sepals very short and slender, ¼ inch; — staminate, medium large, 5½ inches across; sepals medium long and moderately heavy, 1 inch; pedicle short, 6-7 inches.

Fruit mature edible stage 2-2½ x 3-3¾ inches; shape bowl-like, flattened at the base, slightly and often obscurely scalloped; surface occasionally very sparsely warted; skin color pale green

(glass green). Mature fruit very small, 3¼-3½ x 5-5½ inches; weight 1-1½ pounds. Shape much the same as when edible, warts more prominent; blossom scar small, smooth, slightly elevated. Skin color pale greenish white (pale chalcedony yellow) occasionally slightly tinted with pale yellow (straw yellow). Fruit stalk short and slender, 1 inch, usually curved, shallowly furrowed, more or less conforming with the creases between the scallops, somewhat expanded at attachment. Shell very hard and brittle, medium thick, ½ inch, pale green (pale yellow green). Flesh medium thick at the apex ¼-½ inch; texture medium fine, structure appears irregularly fibrous; color white. Seed cavity large, nearest to apex; placental tissue abundant, prominent central core, moist, stringy, very difficult to remove.

Seed small; short, moderately broad and flat, 1.34 x .95 x .17 cm. (408 per oz.); face smooth, dull white (light buff); margin wedge-like.

English Vegetable Marrow. Refs. 14, 19, 21, 24, 26, 27, 30, 31, 32, 33, 34, 42, 50, 64, 67, 73, 74, 75, 76, 86, 92, 93, 98, 101, 117, 130, 136, 137. Syns. English Marrow, London Vegetable Marrow, Long Cream, Long White Bush Vegetable Marrow, Peerless Vegetable Marrow, Vegetable Cream Marrow, White Vegetable Marrow.

Listed occasionally in American catalogs since 1824 (Thorburn), this is often referred to as the standard English squash. The type represents one of the earliest forms of marrow squash grown, but has never been exceedingly popular in this country. In the Gardeners Chronicle of 1849 we find evidence that it had not always been common in English gardens for the writer referred to it as follows: "getting to be quite popular with working class of people in England as a food, also a stock food, especially hogs, and along with scarlet runners and gourds for covering arbours."

First edible fruits were produced at Geneva in 55 days, 7 days earlier than Long White Trailing, in season with Italian Vegetable Marrow and 2 days later than Zucchini. The plants are much less vigorous than those of Long White Trailing, have slightly larger leaves which are less deeply cut and less blotched with gray. The mature edible fruits are much smaller, more regular and less ridged at the base, and are much the same in color except at maturity when the fruits of English Vegetable Marrow are brighter yellow.

Plant bush; occasionally semi-bush; central stem coarse, vigorous; branches many, basal; spread 3-4 feet. Cotyledons moderately short and moderately narrow, 2¾ x 1¾ inches; long oval; apex tapered; color moderately dark green. Leaves moderately small, 11 x 14 inches, broadly 5-cleft; sinus moderately narrow and rounded at the base; margin incised near the base, otherwise dentate, slightly frilled. Surface moderately smooth; color dark dull green, occasionally marked with few large grayish blotches at the intersections of veins and veinlets; petiole moderately long and slender, 15-18 inches. Flower — pistillate, medium large, 5 inches across, orange; ovary cylindrical; sepals very short and slender, ¼ inch; — staminate, medium large, 5 inches across; sepals medium long and heavy, 1 inch; pedicle medium long, 8-9 inches.

Fruit mature edible, 10-12 inches long, 3-3½ inches in diameter at the apex and 2¾-3 inches at the base. Shape nearly cylindrical, slightly enlarged at the apex; ribbed widely at the base; furrows moderately shallow; surface smooth. Skin color pale greenish white (sea foam green) over the entire surface. Mature fruit small, 14-16 x 5-5½ inches at the apex, 3¼-3¾ at the base; weight 5½-6 pounds. Shape much the same when mature edible. Skin

color dull yellow (apricot yellow) over the entire surface. Fruit stalk very short and thick, $\frac{1}{2}$ -2 inches, tapering, deeply furrowed, and expanded at the base. Shell thin, hard and brittle; cream color. Flesh moderately thin, $\frac{7}{8}$ inch, considerably thicker at base; texture moderately coarse, granular, rather firm and crisp; creamy yellow (Naples yellow) in color.

Seed moderately small; moderately short, medium broad and moderately flat, 1.5 x .8 x .28 cm. (232 per oz.); face smooth, dull white (cartridge buff); margin wedge-like.

Epicure. Refs. 75, 76.

This is one of the English Marrows which is grown to a limited extent in this country. It was first offered by James Carter & Co., London, England, and is quite unlike other marrows cultivated for our markets. In many respects this English variety is very much like Winter Luxury. The leaves are slightly larger with the margin more frilled, while the fruits are somewhat less netted and thinner fleshed.

Plant trailing; vines moderately coarse, moderately vigorous, 12-15 feet.

Fruit small; 5-6 x 8-9 inches; weight 5-8 pounds. Shape oblate, distinctly flattened and depressed at base and apex; ribbed widely, furrows obscure, very shallow at base; surface moderately netted with a cork-like skin eruption, some fruits nearly smooth; skin color bright orange (cadmium orange to zinc orange). Fruit stalk ribbed, hard and woody. Shell moderately hard, flesh moderately thin, $\frac{3}{4}$ -1 inch, medium fine texture, rather moist, slightly sweet, color bright yellow (buff yellow); quality fair.

Farr's Benning White Bush. Ref. 63. Syns. Benning Bush, Early Cluster, Farr's White Bush, Green Tinted White Bush.

This is one of the most beautiful strains of the whole group of Patty Pans. We find it listed in 1914 by F. W. Bolgiano & Co. of Washington, D. C., and in 1918 by Alexander Forbes & Co. of Newark, New Jersey. The strain was developed by Charles N. Farr and selected for the uniform scallops and the greenish cream coloring in the younger stages of the fruit.

Flat Green. Syn. Green Gem Flat.

Available catalogs show this to have been listed in the 1913 catalog of James J. H. Gregory Seed Co., and in 1916 by the D. Landreth Seed Co., as "an always green Patty Pan squash, same shape and size as the Early White Bush." This strain was apparently short lived, for it was not listed after 1918. The fruit was a dark olive green, remaining so to maturity.

Fordhook. Refs. 25, 26, 30, 31, 33, 37, 38, 41, 45, 46, 47, 59, 62, 64, 73, 91, 113, 115, 117, 118, 120, 129, 130. Syns. Early Fordhook, Fordhook Marrow, Fordhook Oblong, Oblong Shaped Fordhook.

This small individual squash, similar in type to Black Michigan and Illinois Beauty, was introduced by W. Atlee Burpee of Philadelphia in 1890 and given the name of their trial grounds at Doylestown. The plants of the original Fordhook were of the running type. In 1901, eleven years after the first introduction, Fordhook Bush or Fordhook White Bush was offered. This came from Chauncey P. Coy of Nebraska as a sport and was similar in habit to this group of squash in that short

runners appeared only after the early set fruits had nearly reached full size.

First edible fruits were ready at Geneva in 56 days. Mature fruits suitable for baking produced in 85 days, 5 days later than Delicata and about in season with Table Queen. The vines are somewhat less vigorous than those of Table Queen with leaves smaller, less deeply cut and much less blistered and crumpled. The pistillate flowers have decidedly shorter sepals and have pyriform instead of turbinate-shaped ovaries.

Plant trailing; vines moderately slender and medium vigorous, 8-10 feet; branches many, basal and medial. Cotyledons very short and narrow, $1\frac{5}{8}$ x $1\frac{1}{8}$ inches; short oval; apex rounded; veining prominent; color dark grayish green. Leaves small, 9 x 10 inches, very broadly 5-lobed; sinus very narrow, acute at the base, few sub-sinuses occasionally present on terminal lobe; margin serrate near the base, otherwise dentate; surface smooth, occasionally blistered; color dark green. Flower—pistillate, medium large, 5 inches across, orange; ovary somewhat pyriform, ridged; sepals short and slender, $\frac{1}{2}$ inch;—staminate, medium large, $5\frac{1}{2}$ inches across; sepals medium long and moderately heavy, $1\frac{1}{8}$ inches; pedicel short and very slender, 6-7 inches.

Fruit very small, 8-10 x $3\frac{1}{2}$ -4 inches at the apex, $2\frac{1}{2}$ -3 inches at the base; weight $1\frac{1}{2}$ -2 pounds. Shape long pyriform, slightly constricted near the base; ribbed widely; furrows moderately deep; surface smooth; blossom scar with button, $\frac{1}{4}$ inch. Skin color deep cream (cream color) somewhat irregularly and obscurely mottled with dull yellow (apricot yellow). Fruit stalk moderately short and slender, 2-3 inches, curved, ridged and furrowed, woody and tough, decidedly expanded at attachment. Shell moderately soft and thin, $\frac{1}{16}$ inch, somewhat thicker at the base. Flesh thin, $\frac{5}{8}$ - $\frac{3}{4}$ inch, variable; texture moderately fine, firm, rather juicy, fibrous; insipid, quality poor; color very pale yellow (ivory yellow). Seed cavity large, conforms to fruit shape; placental tissue moderately little, moist, rather tender, easily removed.

Seed small; short, broad and moderately flat, 1.26 x .80 x .24 cm. (304 per oz.); face smooth, dull yellowish brown (pale ochraceous salmon); margin wedge-like.

Fort Berthold. Refs. 33, 41, 73, 129.

Introduced in 1920 by Oscar H. Will & Co. of Bismarck, North Dakota, this small round pumpkin has been somewhat successful because of unusual hardness and earliness. The original plants came from a collection of squash seed secured by Dr. Melvin R. Gilmore from the Indians of the Fort Berthold Reservation.

This variety matured at Geneva in 110 days, 10 days later than Small Sugar and 5 days later than Winter Luxury. The plants are more vigorous than those of Small Sugar, and have distinctly darker green vines and leaves which are considerably less cut and more blistered. The fruits are slightly larger than those of Small Sugar, similar in shape but more deeply and profusely furrowed and lighter orange in color.

Plant trailing; vines medium slender, moderately vigorous, 12-14 feet; very dark green at the base; branches medium in number, basal. Cotyledons moderately short and narrow, $2\frac{1}{8}$ x $1\frac{1}{8}$ inches; long oval, apex nearly rounded; color moderately light green. Leaves moderately small, 11 x 13 inches; broadly but rather shallowly five-lobed, terminal lobe distinctly long tapered; sinuses narrow and rounded at the base; margin incised near the base, otherwise serrated; surface moderately blistered; color dark green; petiole medium long and heavy, 12-15 inches. Flower—pistillate, large, 7 inches across, orange; ovary globular; sepals short and slender, $\frac{1}{2}$ inch;—staminate, moderately large, $6\frac{1}{2}$ inches across; sepals medium long and moderately heavy, $1\frac{1}{8}$ inches; pedicel moderately short, 7-8 inches.



FORDHOOK (upper)

PERFECT GEM

(Three-fourths natural size)



GOLDEN OBLONG

(One-half natural size)

Fruit small, 6-7 x 9-10 inches; weight 7-9 pounds. Shape nearly globular, depressed at both base and apex; ribbed narrowly; furrows numerous and moderately shallow; surface smooth; blossom scar depressed, $1\frac{1}{2}$ - $3\frac{1}{4}$ inch in diameter. Skin color orange (ochraceous orange to deep chrome); often the color is in the form of a very fine lace-like color pattern over the entire surface, within the mesh of which are minute specks of yellowish orange (yellow ochre). Fruit stalk moderately short, 2-3 inches, curved, ridged, woody and tough, expanded at the attachment. Shell medium hard and medium thick, $\frac{1}{8}$ inch, dull orange (orange buff) in color. Flesh medium thick, 1-1 $\frac{1}{4}$ inches; texture rather coarse, fibrous, juicy, soft; insipid, quality poor; color pale yellow (pale orange yellow). Seed cavity moderately large; placental tissue medium in amount, chunky, stringy, difficult to remove.

Seed moderately small, moderately short, medium broad and moderately flat, 1.6 x .86 x .28 cm. (200 per oz.), often slightly twisted at the base; face smooth, dull white (cartridge buff); margin wedge-like.

Geneva Bush. Refs. 50, 101. Syns. Autumn Bush, Everbearing, Philadelphia.

This bush pumpkin described by Goff in 1887 and also by Vilmorin has never been used commercially in this country. It probably had rather limited use and was offered from time to time as a novelty. In 1935 a "new" bush pumpkin was offered by Vaughan Seed Store and by Henry A. Dreer of Philadelphia. The growth habit of the plant is a bush similar to the scallops, crooknecks and some vegetable marrows and is of interest because of its possible adaptation for use in the small garden where space prevents the use of the running sorts.

The fruits of this variety are similar in shape to Mediterranean squash and Epicure summer squash. However color characteristics and habit of plant growth serve to distinguish these sorts.

Plant bush; central stem dark green, medium heavy, medium vigor, spread 4-5 feet; leaves medium large, 10 x 11 inches, broadly 5-lobed; sinuses narrow, rounded at the base; rather light green; margin dentate; petiole long and moderately slender, 14-16 inches, often curved, pale green.

Fruit very small; 4-4 $\frac{1}{2}$ x 8-8 $\frac{1}{2}$ inches; distinctly oblate, sometimes decidedly flattened, depressed at base and apex; ribs numerous, very prominent at base, narrow; surface smooth. Skin color deep green when immature, pale orange when mature. Flesh thin, pale yellow, used in immature stage as a marrow.

Giant Summer Crookneck. Refs. 14, 15, 24, 26, 32, 33, 41, 45, 59, 60, 61, 64, 73, 81, 88, 89, 94, 117, 129, 130. Syns. Arlington Summer Crookneck, Early Giant Summer Crookneck, Early Mammoth Summer Crookneck, Genesee Giant Crookneck, Large Summer Warted Crookneck, Mammoth Crookneck, Mammoth Summer Crookneck, Strickler Giant Summer Crookneck, Strickler Golden Summer Crookneck.

The presence of a small and a large fruited strain of Crooknecks was a matter of record at the time Burr wrote his "Field and Garden Vegetables." The Large Summer Warted Crookneck often produced plants that were semi-runners for in addition to recommending planting the hills at least 6 feet apart seedsmen occasionally pointed out the difficulty in selecting out a strain without runners. There were several local names for this large Crookneck, the most important being "Strickler" and that known in New England as Arlington

Summer Crookneck. Minor improvements of earliness, productiveness and size and shape of fruits often led to the introduction of "new strains" of this widely grown squash.

First edible fruits were produced at Geneva in 60 days, 3 days earlier than Giant Summer Straightneck and 5 days later than Summer Crookneck. The plants are slightly more vigorous than those of Giant Summer Straightneck, have larger and distinctly more blistered leaves with straighter and much darker petioles and have larger pistillate flowers with distinctly crooked ovaries instead of nearly straight ones. The fruits are much the same except in the degree of crook near the base.

Plant bush; central stem coarse, very heavy, dark green, vigorous; branches few, basal. Cotyledons short and moderately narrow, 1 $\frac{3}{4}$ x 1 $\frac{1}{4}$ inches; oval; apex tapered; veining moderately prominent; color grayish green. Leaves moderately large, 12 x 15 inches; very broadly five-lobed; sinus shallow, narrow and acute; margin incised near the base, otherwise dentate, slightly frilled; surface rough, distinctly blistered and occasionally crumpled; color dark, glossy green; petiole moderately long and heavy, 15-18 inches, moderately dark green in color. Flower — pistillate, moderately small, 4 $\frac{1}{2}$ inches across, orange; ovary club-like, constricted and curved near the base; sepals short and slender, $\frac{1}{2}$ inch; — staminate, medium large, 5 inches across; sepals medium long and heavy, 1 inch; pedicel moderately short, 7-8 inches.

Fruit mature edible stage 12-14 inches long, 3 $\frac{3}{4}$ -4 inches in diameter at the apex and 1 $\frac{3}{4}$ -2 $\frac{1}{4}$ inches at the base; shape club-like, distinctly curved and moderately constricted near the base, gradually enlarged at the apex; ribbed very narrowly; furrows shallow; surface rather deeply and profusely warted; skin color deep yellow (cadmium yellow), irregularly and rather obscurely mottled and streaked with pale yellow (apricot yellow). Interior greenish white flesh. Mature fruit moderately small, 16-18 inches long, 5-6 inches in diameter at the apex and 2 $\frac{1}{2}$ -3 inches at the base, weight 3 $\frac{1}{2}$ -4 pounds. Shape much the same as mature edible stage; blossom scar with button $\frac{1}{2}$ inch in diameter, slightly extended. Skin color orange (orange); fruit stalk short and moderately slender, 1 $\frac{1}{2}$ -2 inches, slightly curved, moderately ridged, woody and tough. Shell thick to very thick, $\frac{1}{4}$ - $\frac{3}{8}$ inch; hard and woody, orange (deep chrome) in color. Flesh thin at the apex and medial, basal portion solid; texture moderately fine, slightly granular, soft, rather moist, cream color (cream color).

Seed moderately small; moderately short, moderately broad and flat, 1.42 x .86 x .20 cm. (316 per oz.); face smooth, dull yellowish white (light buff); margin wedge-like.

Giant Summer Straightneck. Refs. 27, 64, 130. Syns. Early Giant Summer Straightneck, Giant Straightneck, Giant Yellow Summer Straightneck, Long Golden Straightneck, Straightneck, Straightneck Summer.

This is a selection from the Giant Crookneck. It was offered in 1896 by Vaughan, Ford and others but apparently most growers preferred to grow the real "goose neck" shaped fruits. The last decade has seen several strains offered which produce 90 per cent or more straight fruits and they are proving popular in many market centers.

First edible fruits were produced at Geneva in 65 days, 5 days later than Giant Summer Crookneck and 10 days later than Summer Crookneck. The plants are slightly less vigorous than those of Giant Summer Crookneck, have somewhat smaller, less blistered and crumpled leaves with distinctly more crooked and lighter green

petioles. The pistillate flowers are smaller and have much straighter ovaries. The fruits are much the same, although this variety produces much straighter and more regular ones.

Plant bush; central stem coarse, heavy, vigorous, nearly black; branches few, basal and medial. Cotyledons moderately short and moderately broad, $2\frac{1}{4} \times 1\frac{1}{2}$ inches; oval; apex tapered; veining prominent; medium light grayish green. Leaves moderately small, 10×14 inches, five-lobed, moderately deep; sinus narrow and acute; margin incised near the base, otherwise dentate, slightly frilled; surface slightly crumpled, rough; color moderately glossy dark green; petiole moderately long and heavy, 16–18 inches, very prominent, sprawling and distinctly curved, pale green in color. Flower — pistillate, very abundant, moderately large, 6 inches across, orange; ovary club-like, slightly curved near the base; sepals short and slender, $\frac{5}{8}$ inch; — staminate many, medium large, $5\frac{1}{2}$ inches across; sepals medium long and heavy, 1 inch; pedicle short, 5–6 inches.

Fruit mature edible stage 12–15 inches long, $3\frac{1}{2}$ –4 inches in diameter at the apex and $2\frac{1}{2}$ inches at the base; shape club-like, apex gradually enlarged, ribbed very narrowly; furrows rather shallow; surface wrinkled, warted and often somewhat corrugated. Skin color deep yellow (apricot to light cadmium) obscurely mottled with pale yellow (pinard yellow). Interior greenish white. Mature fruit small, 15–18 inches long, $5\text{--}5\frac{1}{2}$ inches in diameter at the apex and $3\frac{1}{2}$ –4 inches at the base; weight 4–5 pounds; shape much the same when mature edible, surface deeply and prominently warted and corrugated. Skin color dull orange (deep chrome) with the warts often pale orange (orange buff). Fruit stalk short and slender, $1\text{--}1\frac{1}{2}$ inches, very slightly curved, rather deeply furrowed, woody, tough. Shell thick, $\frac{1}{8}$ – $\frac{3}{8}$ inch; variable, hard, brittle, pale orange (pale orange yellow) with a very thin, more intense orange (orange buff) layer next to the flesh. Flesh thin at medial and apex, $\frac{1}{2}$ – $\frac{3}{4}$ inch, nearly solid at base; texture coarse, granular and soft, pale yellow (cream color).

Seed small; short, broad and moderately flat, $1.37 \times .87 \times .23$ cm. (284 per oz.); face smooth, dull white (cartridge buff); margin wedge-like.

Gibson. Refs. 59, 64, 130.

This was listed by James J. H. Gregory & Son, Marblehead, Massachusetts, in 1893, as a hybrid between Small Sugar and a variety from California. From illustrations the fruit appeared much like Custard but the skin color was a deeper orange.

Golden Custard. Refs. 14, 26, 27, 33, 41, 64, 73, 76, 88, 89, 115, 116, 121, 129, 130. Syns. Extra Large Golden Bush Scallop, Extra Large Golden Custard, Golden Custard Yellow Bush, Mammoth Golden Bush, Mammoth Golden Custard, Mammoth Yellow Bush Scallop, Mammoth Yellow Custard Marrow, Yellow Elector's Cap.

Peter Henderson & Co. of New York, in 1889 introduced this large fruited strain of Yellow Bush Scallop. It is the largest fruited of all the scallops and as such has a place in the group of varieties grown for early summer squash.

First edible fruits were produced at Geneva in 53 days, 7 days earlier than Yellow Bush Scallop, in season with Zucchini and 3 days later than Earliest Prolific. The plants are more vigorous than those of Yellow Bush Scallop, have much heavier and darker green stalks, have somewhat larger leaves which are lighter green in color, more crumpled and blistered, and have distinctly heavier, more prominent, and lighter green

petioles. The mature edible fruits are considerably broader, thinner and decidedly more irregularly scalloped.

Plant bush; central stem very heavy and coarse, vigorous, spread $4\text{--}4\frac{1}{2}$ feet; color very dark green; branches usually absent. Cotyledons moderately short and medium broad, $2\frac{1}{8} \times 1\frac{1}{2}$ inches; oval; apex rounded; veining prominent; color grayish green. Leaves sparse, moderately large, 12×15 inches, broadly and deeply five-cleft, often nearly parted; sinuses narrow, deep, acute; terminal lobes have an occasional shallow sub-sinus; margin incised near the base, otherwise denticulate, slightly frilled; surface distinctly crumpled and blistered; color moderately light glossy green; petiole very heavy and moderately long, 16–18 inches, light green. Flower — pistillate, moderately large, 6 inches across, orange; ovary disk-like, very irregularly waved; sepals very short and very slender, $\frac{1}{4}$ inch; — staminate, moderately large, $6\frac{1}{2}$ inches across; sepals moderately short and moderately slender, $\frac{3}{4}$ inch; pedicle short, 6 inches.

Fruit mature edible, $2\text{--}3 \times 6\text{--}8$ inches; shape disk-like, margin irregular, wavy to horizontal, deeply scalloped; surface smooth; skin color deep yellow (lemon chrome), mottled irregularly with pale yellow (citron yellow). Mature fruit very small, $3\frac{1}{2}$ –4 \times 10–12 inches; weight 5–7 pounds; shape same as mature edible stage. Skin color predominantly deep yellow (cadmium yellow), irregularly mottled with (capucine yellow), usually conforming with the furrows between the scallops. Fruit stalk moderately short and slender, 2–3 inches, curved, ridged and shallowly furrowed, woody and tough. Shell hard and rather thin, $\frac{1}{8}$ inch. Flesh solid at the medial, thin at base and apex; texture coarse, fibrous, rather juicy, moderately tough (cream color).

Seed moderately small; moderately short, moderately broad and rather flat, $1.40 \times .89 \times .29$ cm. (220 per oz.); face smooth, dull yellow (pale ochraceous salmon); margin wedge-like.

Golden Heart. Ref. 47.

The Vaughan Seed Store, Chicago, Illinois, in the 1894 catalog shows a picture of this new introduction. It was originated by C. P. Coy of Waterloo, Nebraska, and was said to have come from a cross between Cocoonut and some unknown variety. The fruit was heart-shaped, golden yellow with dark green stripes along the furrows. Very early and prolific, it can be grouped with the small-fruited fall squash popular at that time.

Golden Oblong. Refs. 14, 27, 33, 41, 64, 73, 90, 96, 129, 130. Syns. Gold Oblong, Golden Long, Golden Long Pie, Long Yellow Field, New Golden Oblong, Oblong Yellow.

Golden Oblong was introduced in 1889 by W. Atlee Burpee & Co., Philadelphia, as a companion variety to Small Sugar. From its appearance and high quality it must be closely related to this variety, although no record of this relationship is available.

The variety attained maturity at Geneva in 120 days, in season with Connecticut Field and 20 days later than Small Sugar. The vines are in most respects similar to those of Connecticut Field, but have pistillate flowers with ovaries which are decidedly more cylindrical. The fruits are similar in color but those of Golden Oblong are longer and have flesh which is drier and darker in color.

Plant trailing; vines medium heavy, moderately vigorous, 12–14 feet, dark green; branches medium number, basal. Cotyledons moderately short and moderately narrow, $2\frac{1}{4} \times 1\frac{1}{4}$ inches; nearly rectangular; apex moderately rounded; color medium green. Leaves medium large, 11×15 inches, moderately deep and broadly lobed; sinus rounded at the base, sub-sinuses shallow and present on all lobes; margin slightly incised at the base,

otherwise denticulate, slightly frilled; surface moderately smooth, occasionally somewhat crumpled; color dark green, often marked with large gray blotches at the intersections of veins and veinlets; petiole moderately short and slender, 12-14 inches. Flower — pistillate, large, 7 inches across, deep orange, ovary cylindrical, green, lightly speckled with pale yellow; sepals short and slender, $\frac{1}{2}$ inch; — staminate, medium large, $5\frac{1}{2}$ -6 inches, pubescence distinctly long; sepals moderately short and moderately heavy, $\frac{3}{4}$ inch; pedicel long, 10-12 inches.

Fruit moderately small, 14-16 x 6-7 inches; weight 8-9 pounds. Shape cylindrical, slightly depressed at the base and apex; ribbed moderately narrow; furrows very shallow and obscure; surface smooth, occasionally very slightly netted; blossom scar small, $\frac{1}{4}$ - $\frac{1}{2}$ inch in diameter, depressed. Skin color dark orange (ochraceous orange) in the form of a fine uniformly distributed lace-like pattern over the entire surface, specked with a pale orange (antimony yellow) under color which occurs within the mesh of the lace-like pattern; occasionally sparsely covered with minute corky specks or eruptions similar in nature to the netting of Winter Luxury; however, no intertwining occurs. Fruit stalk medium long, $3\frac{1}{2}$ -4 inches, decidedly curved, ridged, woody and tough, very slightly expanded at attachment. Shell moderately thin, $\frac{1}{8}$ - $\frac{1}{4}$ inch and moderately hard. Flesh moderately thick, $1\frac{1}{4}$ - $1\frac{1}{2}$ inches, thickest at the base and medial; texture medium coarse, tender, slightly moist, slightly fibrous; rather insipid, quality fair; color pale orange to orange (pale orange yellow to cadmium yellow). Seed cavity large, conforms to fruit shape; placental tissue moderately abundant, moist, slightly fibrous, easily removed.

Seed medium size; medium long and broad, medium plump, $1.90 \times 1.20 \times .32$ cm. (140 per oz.); face smooth, dull white (cartridge buff); margin wedge-like.

Green Bush Scalloped. Ref. 24.

As described by Burr in 1863, the fruit of this bush squash was similar in size and form to the Yellow and the White Bush Scalloped. The skin color of the fruit was given as bottle green, marbled or clouded with shades of lighter green. This probably differed little from the strain introduced later as Flat Green by the D. Landreth Co.

Green Striped Bergen. Refs. 14, 19, 24, 34, 50, 78, 101, 130, 136, 137. Syns. Bergen, Green Striped Bush, Marrow Striped Cluster, Striped Custard Marrow.

This early bush pepo was described by Burr in 1863 and is therefore one of the earliest of the type known today as individual fall squash. It was listed until the late eighties by the leading seedsmen. While the description below comes from notes taken at Geneva in 1885 other published records show the shape to be quite variable from bell-shaped to quite flat, the color, however, remaining dark green and white striped.

Plant bush; central stem dark green, thick, about 2 feet long; branches moderately many, spread 4-5 feet, very vigorous. Leaves very large, five-lobed, rounded at the ends, pale green; petioles long and moderately slender.

Fruit very small, 5-6 x 4-5 inches; inversely bell-shaped; often ovate, depressed at the base; ribs numerous, most distinct at the base; skin color creamy white, spotted and blotched with pale and dark green; furrows very dark green. Fruit stalk slender, very dark green, curved, sparsely furrowed, spiny.

Green Summer Crookneck. Refs. 14, 50, 74, 75, 95, 115, 130. Syns. Long Green Crookneck, Long Green Summer Crookneck.

This crookneck which was popular from 1885 to the late nineties is seldom cultivated today. Illustrations

and descriptions are found in early catalogs particularly those of Johnson & Stokes for 1892 and D. Landreth Seed Co. for 1885. The Green Crookneck squashes were grown by gardeners in the Philadelphia section but seem to have been little known elsewhere. Although catalog listings occur as early as 1859 it was not described by Burr.

This differed from regular Crookneck in color of skin, and possibly was a trifle larger.

Plant trailing; vines very dark green at base, vigorous; leaves large, shallowly five-lobed, deep green; petioles pale green.

Fruit small, 12-14 x 3-3 $\frac{1}{2}$ inches, greatest diameter at the apex; club-shaped, more or less crooked near the base; surface warted and corrugated, skin color very dark green, often irregularly and narrowly striped with pale or yellowish green. Mature fruits have a shell hard and tough and flesh moderately dry, sweet, well flavored and pale yellow in color.

Illinois Beauty. Refs. 77, 88, 117.

This was a strikingly colored autumn variety cataloged in 1890 by James J. H. Gregory & Sons, Marblehead, Mass. These early fall squashes lost favor with the introduction of improved maximas and it has been only within recent years, subsequent to the introduction of Table Queen, that the type has again found a market.

The variety is most like Delicata and Black Michigan in shape, although usually somewhat more tapered at the base. The distinct skin color pattern serves to separate it from others in the group.

Plant semi-trailing, vigorous grower. Fruit very small, 8-10 x 3-4 inches. Shape nearly cylindrical, slightly tapering at the base; ribs moderately broad, prominent; furrows moderately deep; surface moderately smooth. Skin color at the ends is dark green and in the center is a broad, definite band of orange yellow. Flesh thick, firm, fine texture, dry, sweet, yellow, quality good. Seed cavity very small.

Italian Rapid Bush

D. V. Burrell Seed Growers Co., Rocky Ford, Colorado, introduced this new strain in 1933. It is a prolific strain of Cocozelle producing fruits which are more slender, have more definite and regular color stripes of greater contrasting green shades, and which in the mature stage has more yellow to replace the green.

Italian Vegetable Marrow. Refs. 14, 24, 26, 27, 33, 45, 48, 50, 64, 86, 101, 130, 137. Syns. Asparagus Squash, "Cocozelle," Egg Plant Squash, Italian Green Striped.

This name, which in recent years has come to be associated with a definite group of varieites, is also one of the oldest specific names. Burr in 1863 listed and described it, but apparently little notice was taken of the variety until sometime in the eighties. It was grown at the Geneva Station as Italian Green Striped, and this name with an illustration similar to that which appeared in Vilmorin was used in the 1890 catalog of James J. H. Gregory of Marblehead, Massachusetts. Thorburn published this illustration in 1895 but the variety was named as Italian Vegetable Marrow.

The name Cocozelle appeared in the 1892 catalog of Frank Ford & Son, Ravenna, Ohio, and also in that

of W. Atlee Burpee for 1893. The names Cocozelle and Italian Vegetable Marrow were from that time on used rather interchangeably. In the catalogs of various Italian seed houses can be found many varieties which belong in this group.

First edible fruits were produced at Geneva in 55 days, 3 days earlier than Long Green Trailing, in season with English Vegetable Marrow and 2 days later than Zucchini. The plants are much more vigorous than those of Cocozelle, have larger leaves less blotched with gray and have larger flowers. The fruits are similar in shape to those of Cocozelle but are larger and distinctly more prominently ribbed at the base.

Plant bush; central stem heavy, coarse, very vigorous, spread 4-5 feet; branches many, basal. Cotyledons moderately short and moderately narrow, $2\frac{1}{4} \times 1\frac{3}{8}$ inches; oval; apex tapered; color dark green. Leaves medium large, 12 x 15 inches, rather narrowly five-lobed; sinus rather narrow and rounded at the base; sub-sinuses many; margin incised at the base, otherwise serrate, finely frilled; surface moderately smooth; color dark green, occasionally marked with large irregular gray blotches at intersections of veins and veinlets; petiole very long and moderately slender, 20-22 inches. Flower — pistillate, large, 7 inches across; orange; ovary cylindrical; sepals very short and slender, $\frac{3}{8}$ inch; — staminate, moderately small, 4 inches across; sepals moderately short and very thick, $\frac{3}{4}$ inch; pedicle short, 6-7 inches.

Fruit mature edible stage 14-16 inches long, $3-3\frac{1}{2}$ inches in diameter at the apex and $2\frac{3}{4}-3$ inches at the base. Shape nearly cylindrical, slightly enlarged at the apex, often slightly curved, ribbed moderately wide and furrowed moderately deep at the base; surface smooth. Skin color predominantly dark green (dull greenish black) in the form of a lace-like color pattern over the whole fruit, but concentrated in narrow, solid, dark green stripes which more or less conform with the ridges, often somewhat irregularly blotched with same color; ground color appearing within the mesh is yellowish green (sea foam yellow to margarite yellow); those areas between the dark stripes are less concentrated and lighter green (calla to cress green) in color. Interior greenish white flesh. Mature fruit moderately small, 22-25 inches long, $3\frac{1}{2}-4\frac{1}{2}$ inches in diameter at the apex and $2\frac{3}{4}-3\frac{1}{2}$ inches at the base; weight 6-6 $\frac{1}{2}$ pounds. Shape same as mature edible stage, ridges much more prominent; skin color dark dull green (dull blackish green) laced stripes $\frac{3}{4}-1$ inch broad, somewhat irregular in outline, alternating with pale yellow (light cadmium) laced stripes $\frac{3}{8}-\frac{1}{2}$ inch wide; both stripes occasionally blotched with the contrasting color; ground color appearing within the mesh is yellowish cream (cream color). Fruit stalk short and thick, $1\frac{1}{4}-1\frac{3}{4}$ inches, straight, abruptly tapered, prominently ridged to conform with those of the fruit, expanded at attachment, hard, woody and tough. Shell moderately hard. Flesh medium thin, $\frac{3}{4}-1$ inch, slightly thicker at the base; texture coarse, granular, soft; pale buff (cream color).

Seed moderately small; moderately short, medium broad and medium plump, $1.66 \times .87 \times .31$ cm. (180 per oz.); face smooth, dull white (light buff); margin wedge-like.

Long Green Trailing. Ref. 33. Syn. Green Vining Vegetable Marrow.

This type of English marrow has been offered by Stumpp & Walter Co. of New York and Henry A. Dreer of Philadelphia for many years. Its principal use is as a summer squash, for when picked young, boiled and served as a melting side dish with cream sauce it is considered superior to our American summer squash.

The edible fruits were first produced at Geneva in 58 days, 4 days earlier than Long White Trailing and 3 days later than Italian Vegetable Marrow. The vines

are equally as vigorous as Long White Trailing, have slightly larger leaves not as deeply cut and less sparsely blotched with gray. The fruits are very much like those of Italian Vegetable Marrow in shape and color, but are distinctly thicker, heavier and more prominently ridged at the base.

Plant trailing; vines moderately heavy, moderately vigorous, 12-15 feet; branches few, basal. Cotyledons medium long and medium broad, $2\frac{7}{8} \times 1\frac{1}{2}$ inches; long oval; apex rounded; color medium dark green. Leaves medium large, 12 x 14 inches, broadly five-cleft with each lobe having 2-4 shallow sub-sinuses; sinus narrow, slightly rounded at the base; margin slightly incised near the base, otherwise serrate, frilled; surface moderately smooth; color dark green occasionally sparsely blotched with gray; petiole long and moderately heavy, 18-20 inches. Flower — pistillate, moderately large, $6\frac{1}{2}$ inches across, orange; ovary club-like, apex slightly enlarged; sepals very short and very slender, $\frac{1}{4}$ inch; — staminate, medium large, $5\frac{1}{2}$ inches across; sepals medium long and heavy, 1 inch; pedicle moderately short, 7-8 inches.

Fruit mature edible stage 10-12 inches long, 4-5 inches in diameter at the apex and $3\frac{1}{2}-4\frac{1}{2}$ inches at the base; shape nearly cylindrical slightly tapering towards the base; ribbed widely, very prominent at the base; surface smooth; skin color predominantly dark dull green (dull greenish black) in the form of broad, irregular stripes, alternated with lace-like, narrower stripes of lighter green (calla green), through the mesh of which shows the greenish yellow (sea foam yellow) ground color. Interior pale greenish white (pale glass green). Mature fruit small, 15-16 inches long, 5-6 inches in diameter at the apex and $5-5\frac{1}{2}$ inches at the base; weight 6-7 pounds. Shape nearly cylindrical; skin color much the same as when mature edible except that the lighter shades of green are replaced by yellow (antimony yellow). Fruit stalk moderately short and heavy, 2-3 inches, deeply furrowed and much expanded at the base, hard and woody. Shell medium thick, $\frac{1}{8}$ inch, pale green (glass green), woody and brittle. Flesh very coarse and granular, firm, pale orange (light orange yellow).

Seed medium large; medium long and broad and medium plump, $1.8 \times 1.07 \times .33$ cm. (146 per oz.); face smooth, pale buff (cartridge buff); margin wedge-like.

Long Island White Bush. Refs. 17, 33, 41, 46, 60, 61, 64, 73, 76, 129, 130. Syns. Improved Long Island White, Long Island Mammoth White.

This was listed by Peter Henderson Co., New York, in 1892, and undoubtedly had been in use as a separate strain for many years. In early catalogs it was often confused with Mammoth White Bush Scallop but the strain today is known for its bowl-like fruit.

First edible fruits were produced at Geneva in 54 days, 2 days earlier than White Bush Scallop and 4 days later than Earliest Prolific. The plants are less vigorous than those of White Bush Scallop and have smaller leaves which are much smoother. The flowers are smaller and ovaries are decidedly less scalloped. The mature edible fruits are much thicker than those of White Bush Scallop, decidedly smoother and less scalloped; also are larger than Earliest Prolific and decidedly lighter in color.

Plant bush; central stem moderately slender, medium vigor, spread 3-3 $\frac{1}{2}$ feet; branches moderately many, basal. Cotyledons moderately short and medium broad, $2\frac{1}{4} \times 1\frac{1}{2}$ inches; oval; apex tapered; veining moderately prominent; color medium green. Leaves moderately small, 11 x 13 inches, rather broadly and deeply five-lobed; sinus medium broad and rounded at the base, sub-sinuses occasionally present on terminal lobe; margin denticulate, slightly incised near the base; surface occasionally somewhat



ITALIAN VEGETABLE MARROW

(Two-thirds natural size)



MANDAN

Three-fourths natural size

crumpled; color dark green; petiole medium long and moderately slender, 15–16 inches. Flower—pistillate, moderately small, $4\frac{1}{2}$ inches across, orange; ovary nearly globular, very nearly scalloped; sepals short and slender, $\frac{1}{2}$ inch;—staminate, medium large, 5 inches across; sepals medium long and moderately slender, $1\frac{1}{4}$ inches; pedicle medium long, 8 inches.

Fruit mature edible stage $2-2\frac{3}{4} \times 4\frac{3}{4}-5$ inches; shape bowl-like, very shallowly scalloped, often obscurely; ribbed widely; furrows very shallow; surface smooth. Skin color white. Interior nearly white. Mature fruits very small, $3\frac{1}{2}-4 \times 5\frac{1}{2}-6$ inches; weight $2-2\frac{1}{2}$ pounds. Shape much the same when mature edible, scalloping slightly more accentuated. Skin color creamy white (ivory yellow) indistinctly mottled with very pale yellow (colonial buff), often russeted on the base. Fruit stalk moderately short and slender, $2-2\frac{1}{2}$ inches, usually curved, shallowly furrowed, expanded at attachment, hard and woody. Shell moderately hard and thin, $\frac{1}{8}$ inch, creamy white (ivory yellow) in color. Flesh $1-1\frac{1}{4}$ inches, thickest at the scallop, apex very thin, $\frac{1}{2}$ inch; texture medium fine, rather fibrous, soft, cream color (colonial buff).

Seed moderately small; moderately short, moderately broad and rather flat, $1.5 \times .9 \times .28$ cm. (212 per oz.); face smooth, very pale buff (light buff); margin wedge-like.

Long White Trailing. Refs. 33, 41, 49, 50, 73, 74, 75, 76, 129. Syns. White Trailing, White Vining Vegetable Marrow.

As a companion variety to Long Green Trailing the fruits of this variety, except in size, differ little from English Vegetable Marrow. It is carried by Henry A. Dreer of Philadelphia and Stumpp & Walter of New York City, but is seldom found on our markets.

First edible fruits were produced at Geneva in 62 days, 7 days later than English Vegetable Marrow and 9 days later than Moore's Cream. The vines are equally as vigorous as Moore's Cream although much heavier and have leaves which are smoother and less inclined to be cone-like. The mature edible fruits are similar in color, decidedly larger and much more ridged at the base; at full maturity the fruits of Moore's Cream are much darker orange.

Plant trailing; vines moderately coarse, moderately vigorous, 12–15 feet; branches many, basal. Cotyledons medium long and moderately narrow, $2\frac{1}{2} \times 1\frac{1}{4}$ inches, nearly rectangular; apex moderately rounded; color medium green. Leaves small, 10 x 12 inches, flattened, broadly and deeply five-lobed; sinuses narrow and rounded at the base; margin incised near the base of the blade, otherwise serrate; surface smooth; color moderately dark green, moderately blotched with gray at the intersections of the veins and veinlets; petioles short and slender, 10–12 inches. Flower—pistillate, medium large, $5\frac{1}{2}$ inches across, orange; ovary cylindrical; sepals very short and very slender, $\frac{1}{8}-\frac{1}{4}$ inch;—staminate, medium large $5\frac{1}{2}-6$ inches across; sepals medium long and very heavy, 1 inch; pedicle moderately long, 9–10 inches.

Fruit mature edible stage 16–20 inches long, $4\frac{1}{2}-5$ inches in diameter at the apex and $4-4\frac{1}{2}$ inches at the base; shape cylindrical, occasionally somewhat constricted near the base; ribbed rather prominently at the base and medial, otherwise surface is smooth. Skin color pale green (glass green) obscure, lace-like pattern over the entire fruit through the mesh of which shows the greenish white (pale dull green yellow) ground color. Interior pale greenish white. Mature fruit moderately small, 18–22 inches long, $5\frac{1}{2}-6$ inches in diameter at the apex and $4\frac{1}{2}-5$ inches at the base; weight 7–8 pounds; shape much the same as mature edible fruits; skin color buff (antimony yellow) over entire fruit. Fruit stalk moderately short and medium heavy, $2\frac{1}{2}-3$ inches, deeply furrowed to conform with the ridges on the fruit, hard and woody. Shell medium thick, $\frac{1}{8}$ inch, hard, woody, pale yellow (straw yellow). Flesh moderately thin, $\frac{3}{4}-\frac{7}{8}$ inch, coarse, granular, firm, buff (cream color).

Seed medium large; medium long, moderately narrow and medium plump, $1.8 \times .92 \times .30$ cm. (168 per oz.); face smooth, pale buff (cartridge buff); margin wedge-like.

Mammoth White Bush Scallop. Refs. 14, 26, 31, 33, 41, 61, 64, 73, 88, 95, 121, 129, 130. Syns. Early Mammoth White Bush, Giant White Bush Scallop, Large Patty Pan.

A. W. Livingston's Sons of Columbus, Ohio, in 1891 offered seed of Mammoth White Bush Scallop. The new introduction proved popular and it has remained one of the most widely used strains of the scallop squash. The plants of this variety are much more vigorous than those of Early White Bush Scallop, but otherwise are much alike. The fruits are similar in type but are distinctly larger and profusely covered with wart-like protuberances.

Mandan. Refs. 33, 73. Syns. Early Mandan, Rapid Mandan.

The name comes from the Mandan Indians who had grown this squash for many generations before it was introduced to the trade in the 1912 catalog of Oscar H. Will & Co., Bismarck, North Dakota. In color this is much like the Green Striped Bergen grown nearly a century ago but the shape is decidedly more oblate. The plant is of the bush type until after the first fruits are well grown; runners then appear and produce a second set of fruits.

First edible fruits were produced at Geneva in 56 days, 4 days earlier than Giant Summer Crookneck, in season with Fordhook and 6 days later than Earliest Prolific. The vines are much less vigorous than those of Fordhook, have slightly larger and distinctly lighter green leaves and have flowers with somewhat longer and distinctly broader sepals. The mature edible fruits are similar in shape to Long Island White Bush, but have a much rougher surface and a very individualistic color pattern.

Plant trailing; vines very dark green, slender, very weak, 4–5 feet; branches few, basal. Cotyledons moderately short and moderately narrow, $2 \times 1\frac{3}{8}$ inch, oval; apex tapered; veining yellowish green, rather prominent; color moderately light green. Leaves small, 10 x 12 inches, shallowly lobed; sinus acute, moderately shallow; margin dentate, slightly frilled; surface smooth; color distinctly light green; petiole moderately short and slender, 12–14 inches, moderately light green. Flower—pistillate, medium large, $5\frac{1}{2}$ inches across, orange; ovary short turbinate, slightly ridged and wrinkled; sepals moderately short and somewhat leaf-like, $\frac{7}{8}$ inch;—staminate, medium large, $5\frac{1}{2}$ inches across; sepals medium long and thick, 1 inch; pedicle short, 6–7 inches.

Fruit mature edible stage $3-3\frac{1}{2} \times 4-5$ inches; shape nearly oblate, flattened at base and apex, somewhat depressed at the base; ribbed widely; furrows medium deep; surface uneven and moderately warted, wrinkled. Skin color nearly white, striped and mottled irregularly with green (Varley's green). Interior pale green (glass green), flavor excellent. Mature fruit very small, $4-4\frac{1}{2} \times 7-7\frac{1}{2}$ inches; weight 3–4 pounds; shape much the same as mature edible; ridges more prominent and surface irregularities more accentuated. Skin color greenish white (sea foam yellow) stripes $1\frac{1}{2}-1\frac{3}{4}$ inches broad at the medial, sparsely blotched with small, irregularly laced, green (light bice green) areas. Alternating stripes conform with the ridges, $\frac{3}{8}-\frac{1}{2}$ inch broad, somewhat irregular, dark green (dark dull yellow green) in color and through the mesh of lacing shows the pale greenish white (sea foam yellow) of the contrasting stripe.

Fruit stalk short and slender, 1-2 inches, curved, ridged, woody and tough, easily detached. Shell medium thick, $\frac{1}{8}$ inch, hard, woody and brittle, pale greenish yellow (pale dull green yellow), under which a thin bright green (apple green) layer is present. Flesh moderately thin, $\frac{3}{8}$ -1 inch at the medial and base, much thinner at apex, texture rather coarse, fibrous, moderately soft and wet; insipid; nearly white in color.

Seed moderately small; moderately short, broad and flat, 1.47 x .94 x .20 cm. (260 per oz.); face smooth dull buff yellow (pale ochraceous salmon); margin rounded.

Moore's Cream. Refs. 11, 74, 75, 130. Syn. Moore's Vegetable Cream.

Moore's Cream is one of the oldest of the English Marrows. It was listed by Hovey & Co. of Boston in 1868, and has been carried by many of the American seedsmen as the single representative of this group of squash. It was originally introduced by Thomas Moore, who was at the time secretary of the Royal Horticultural Society.

First edible fruits were produced at Geneva in 53 days, 9 days earlier than Long White Trailing, in season with Zucchini and a day later than Boston Greek. The vines are very much like those of Long White Trailing, with the leaves slightly smaller and less deeply cut. The mature edible fruits are much smaller, more regular, and when mature have a skin color decidedly darker orange in color.

Plant trailing; vines slender, moderately vigorous, 12-15 feet, moderately light green; branches many, basal and medial. Cotyledons moderately short and moderately narrow, somewhat rectangular; apex rounded; veining moderately prominent; color medium green. Leaves small, 9 x 12 inches, broadly and rather deeply 5-lobed; sinus broad, obtuse; margin incised near the base, otherwise serrate, moderately frilled; color medium green, occasionally blotched with gray at vein intersections; petiole short, 10-12 inches; flower — pistillate, medium large, 5½-6 inches across, orange; ovary plump, cylindrical; sepals very short and very slender, $\frac{3}{16}$ inch; — staminate, medium large, 5-5½ inches across; sepals moderately short and thick, $\frac{7}{8}$ inch; pedicel medium long, 8-9 inches.

Fruit mature edible stage 8-9 x 4-4½ inches; shape short cylindrical, slightly bulbous at the apex; ribbed widely; furrows very shallow; blossom scar ½ inch in diameter. Skin color greenish white (pale dull green yellow) faintly laced in obscure stripes with pale green (glass green). Interior pale greenish white. Mature fruit small, 10-12 x 6-7 inches; weight 5-6 pounds; shape much the same when mature edible; surface smooth with slight ridging at extreme apical and basal portions; skin color dull orange (orange buff to zinc orange) over the entire surface. Fruit stalk moderately short and medium heavy, 2-3 inches occasionally curved, ridged, woody and tough. Shell medium thick, $\frac{1}{8}$ inch, hard, brittle, cream color (warm buff). Flesh moderately thin, $\frac{3}{4}$ -1 inch; texture very coarse, granular and soft; color yellowish cream (pale orange yellow).

Seed moderately small; moderately short, medium broad and moderately flat; 1.55 x .84 x .27 cm. (280 per oz.); face smooth, dull white (cartridge buff); margin wedge-like.

Nantucket. Refs. 14, 21, 24, 27, 31, 50, 51, 64, 65, 90, 130. Syns. Black Negro, Black Sugar, Hard Shell, Nantucket Negro, Nantucket Pie, Nantucket Sugar, Negro, New Hampshire, Niggerhead, St. George.

This, even older in variety lists than the Sugar Pie Pumpkin, was originally brought from the Azores as a sweet pumpkin and first grown sometime previous to 1860 on Cape Cod and Nantucket Island off the

coast of Massachusetts. It was cataloged by all of the older seedsmen and exclusively used for Yankee pumpkin pies.

The fruits of this variety are rather variable both as to shape and degree of ridging and furrowing. Many resemble Boston Pie in general shape, but have more pronounced ridges and depressions at the base. Others are more oblong and decidedly more ridged. In any case the blackish green skin color and the presence of wart-like protuberances serve to further separate it from other sorts in this group.

Plant trailing; vines medium heavy, very dark green at the base, gradually fading into a pale green near the ends, very vigorous, often 20 feet long. Leaves five-lobed with terminal lobe having sub-sinuses; margins incised near the base of blade, otherwise dentate, dark green in color, sometimes blotched with gray; petioles pale green.

Fruit small; 6-7 x 8-9 inches, occasionally considerably longer than broad; shape oblate to nearly globular, often distinctly oblong fruits produced; ribbed profusely, narrow; furrows moderately shallow, narrow, more pronounced at the base; surface rather rough; moderately covered with small, irregular wart-like protuberances and small irregular corrugations; skin color deep glossy green, finely but obscurely mottled with pale green dots with the warts mottled with yellowish green; after storage green is replaced by yellow or orange. Shell very hard, although warts are rather soft. Fruit stalk short and thick, deeply furrowed, lighter green than the fruit. Flesh moderately thick, fine texture, moderately dry, sweet, good flavor, yellow in color.

Omaha. Refs. 33, 41, 73, 129.

The Omaha Indians of Nebraska grew this variety and from them it was secured by Dr. Melvin R. Gilmore along with other forms of Indian cucurbits. After a few years selection it was introduced in 1924 by Oscar H. Will & Co., of Bismarck, North Dakota.

Omaha was the earliest of the winter pumpkins, having attained maturity at Geneva in 95 days, 5 days earlier than Small Sugar, 10 days earlier than Winter Luxury and 25 days earlier than Golden Oblong. The vines are decidedly shorter and less vigorous than those of Golden Oblong, have smaller leaves and more pointed and prominent terminal lobes, are smoother and darker green in color; also have slightly smaller flowers which are more crumpled and ruffled about the margins. The fruits are much the same in shape and color but those of Omaha are decidedly smaller.

Plant trailing; vines moderately slender, moderately weak, 6-8 feet; branches moderately few, basal. Cotyledons short and medium broad, 1¾ x 1½ inches, nearly round to short oval; apex rounded; color moderately light green. Leaves small, 10 x 12 inches, moderately deep lobed, terminal lobe broad and distinctly pointed; sinus moderately narrow and rounded at the base; margin slightly incised near the base, otherwise serrate; surface smooth; dark green; petiole very short, 8-10 inches. Flower — pistillate, medium large, 5½-6 inches across, bright orange, corolla tips curved and crumpled; ovary somewhat balloon-like; sepals short and slender, ½ inch; — staminate, medium large, 5 inches across, corolla tips curved and crumpled; sepals moderately short and moderately heavy, $\frac{7}{8}$ inch; pedicel short, 5-6 inches.

Fruit very small, 8-9 x 5-6 inches; weight 3-4 pounds; shape cylindrical, full at the base and slightly depressed at the apex; ribbed narrowly; furrows very shallow; surface smooth; blossom scar with button ¼ inch in diameter, slightly protuberant. Skin color predominantly dark orange (ochraceous orange) in the form of a fine, delicate and uniformly distributed lace-work over the

entire surface; specked with pale orange under-color (antimony yellow) within the mesh. Fruit stalk moderately short, 2-2½ inches and slightly curved. Shell moderately hard and thin, ⅛ inch, orange in color. Flesh moderately thin, ¾ inch; texture moderately fine, rather firm, tender; moderately dry, slightly sweet; quality moderately good; color pale orange (cadmium yellow). Seed cavity large, conforms to fruit shape; placental tissue moderately abundant, rather moist, tender, rather easily removed.

Seed moderately small; moderately short, moderately broad and rather flat, 1.49 x .96 x .26 cm. (240 per oz.); face smooth, dull white (cartridge buff); margin wedge-like.

Patagonian. Refs. 14, 24, 42, 44, 48, 50, 101, 124, 130, 137. Syns. Patagonia, Seven Years, Seven Years Custard.

This was one of the rough, prominently ribbed pumpkins grown for stock feed and listed by Thorburn in 1847. It was described by Burr in 1863 as similar to Custard but with a green skin color.

Plant trailing; vines very dark green at the base, very vigorous; leaves large, five-cleft; margin serrate; color clear green, surface smooth; petioles long, moderately slender, and pale green.

Fruit moderately small, 15-18 x 8-9 inches. Shape nearly cylindrical to long oval; very prominently marked with distinct, narrow, rounded ribs extending from base to apex; furrows very broad and moderately deep; surface otherwise smooth. Skin color very dark green almost black, which is retained after full maturity. Flesh pale yellow, rather poor quality.

Pen-Y-Byd. Refs. 24, 74, 75, 76, 130. Syn. Best in the World.

This is one of the early English Marrows which at one time was quite popular in this country. Descriptions taken from the catalog of Sutton & Sons of 1896, and from trial ground notes of the Central Experimental Station at Ottawa agree in emphasizing the quality and fine flavor of the fruits. The plant is of trailing habit and medium growth, short jointed, setting a fruit at nearly every joint; fruits are smooth, round, of a delicate creamy white color and average about 6 inches in diameter. It was offered in this country in 1923 by Carters Tested, Inc.

Perfect Gem. Refs. 14, 25, 26, 28, 31, 33, 37, 41, 47, 48, 50, 59, 64, 75, 89, 104, 109, 116, 117, 120, 129, 130, 134. Syns. Cream, Gem, Little Gem.

This was offered by Grant Thorburn of New York, W. Atlee Burpee of Philadelphia, and James J. H. Gregory & Son of Marblehead, Massachusetts, about 1882. Although it possesses good keeping qualities, it is chiefly used as a late summer or fall variety.

The variety matured in 86 days at Geneva, in season with Table Queen and 6 days later than Delicata. The vines are less vigorous than those of Table Queen with the leaf sinuses acute instead of rounded. The flowers are smaller and have distinctly shorter sepals. The fruits are somewhat similar in shape to Long Island White Bush although Perfect Gem is smaller, more deeply furrowed and a much deeper cream color.

Plant trailing; vines slender, very dark green, medium vigor, 8-10 feet; branches few, short, basal. Cotyledons moderately short and moderately narrow, 2 x 2½ inches; oval; apex rounded; color moderately dark green. Leaves small, 9 x 12 inches, broadly and

rather deeply five-cleft; sinus narrow and acute; margin denticulate; surface smooth, occasionally slightly blistered; color moderately dark green; petiole very short, 9-10 inches. Flower—pistillate, moderately small, 4-4½ inches across, pale orange; ovary short turbinate; sepals short and slender, ½ inch;—staminate, moderately small, 4-4½ inches across; sepals moderately short and moderately heavy; ¾ inch; pedicel very short, 3½-4 inches.

Fruit very small, 4-5 x 5-6 inches; weight 1-1½ pounds. Shape somewhat globular, flattened at base and apex, depressed at the base; ribbing narrow; furrows moderately deep; surface otherwise smooth. Skin color deep cream (light ochraceous buff). Fruit stalk short and slender, 1-2 inches, curved. Shell hard and thin, ⅛ inch. Flesh thin, ½-¾ inch, thickest at the base; texture moderately fine, not fibrous, tender, medium dry; insipid, quality poor; color cream (warm buff). Seed cavity large; placental tissue abundant, moist, tender, rather difficult to remove.

Seed small, short, broad and moderately flat, 1.2 x .80 x .26 cm. (316 per oz.); face dull white (cartridge buff); margin wedge-like.

Pineapple. Refs. 14, 21, 26, 27, 48, 50, 64, 89, 91, 95, 101, 115, 117, 130. Syns. Early Pineapple, White Pineapple, White Turban.

This was a peculiar looking variety offered by Landreth, Gregory, Burpee and others about 1884. The original seed was reputed to have come from Chili. W. W. Tracy reported to the Michigan Horticultural Society in 1885 that its poor quality would limit its use and apparently it was grown more as a novelty than as a commercial variety.

No variety is very similar to this one. It can be best compared to White Bush Scallop with the fruits of White Pineapple distinctly longer from base to apex and the scallops more prominent and jagged.

Plant trailing; vines heavy, vigorous and productive. Leaves large, five-lobed, pale green; petioles long and moderately slender.

Fruit small; 8 x 8 inches, usually somewhat spindle-like with medial bordered by 5 pairs of prominent projections, as in the scallop varieties, some incline outward and others toward the apex or the base. Surface smooth; skin color nearly white; fruit stalk small, slender and somewhat tapered.

Rotherside Orange. Refs. 75, 76. Syn. English Otherside Orange.

William M. Hunt & Co. of New York listed this English Marrow in 1919 but the variety has not proved popular except with the private estate gardener.

Plant trailing; vines slender, medium vigor, 8-10 feet. Leaves small, dark green, marked with gray blotches along the midrib; petioles short and slender.

Fruits mature edible very small, 3¼-4 x 4½-5 inches, weight 1-1¼ pounds; shape oblate, slightly depressed at the apex, full at the base; ribbed narrowly; furrows shallow; surface otherwise smooth; skin color dull yellow (reed yellow); shell soft; interior greenish yellow. Mature fruit slightly larger, with dull orange yellow (ochraceous buff) skin and hard, woody shell.

Sandwich Island. Refs. 26, 33, 41, 53, 61, 73, 129, 130. Syns. Bugless, Bugproof, California Squash, Giant Prize, New Banana, Portugese.

Sandwich Island was listed in the 1902 catalog of H. W. Buckbee, Rockford, Illinois, as a new variety coming from the Sandwich Islands. It apparently has no prototype in European lists but as grown at Geneva appears somewhat like Custard pictured in Burr's Field and Garden Vegetables. It has been especially recommended as drought resistant and is rather late in matur-

ing. The names Bugless and Bugproof may have been used because of its rather vigorous and coarse growth.

Mature fruits of Sandwich Isle were produced at Geneva in 125 days, in season with Large Tours and 5 days later than Connecticut Field. The vines are decidedly heavier and much more vigorous than those of Connecticut Field, much as Large Tours. The leaves are much larger than those of Connecticut Field, more crumpled and have decidedly thicker spines on the petioles. The flowers are smaller than those of Large Tours and are more prominently veined. The fruits are often similar to Large Tours in general shape but are distinctly deeper furrowed and more uniform in color pattern.

Plant trailing; vines very coarse and heavy, moderately dark green and nearly black at the base, exceedingly vigorous, 20–25 feet; branches medium in number, basal and medial. Cotyledons moderately long and medium broad, $3\frac{1}{8} \times 1\frac{5}{8}$ inches; long oval; apex tapered; color moderately dark green. Leaves very large, 14×20 inches, five-lobed; sinus moderately deep, and rounded at the base; sub-sinuses shallow, on all lobes; margin incised near the base, otherwise serrate, moderately frilled; surface moderately blistered; color moderately dark, dull green; vines slightly lighter green; petiole moderately short and moderately heavy, 12–14 inches; spines distinctly thick, usually somewhat hooked. Flower — pistillate, moderately large, $6\frac{1}{2}$ inches across, pale orange with a distinct green vein through the center of each petal; ovary somewhat cylindrical, distinctly ridged and furrowed; sepals very short and slender, almost absent, $\frac{1}{8}$ inch or less; — staminate, moderately large, 6 inches across; sepals moderately short and moderately heavy, $\frac{3}{4}$ inch; pedicel moderately long, 9–10 inches.

Fruit large, $15\text{--}20 \times 9\text{--}12$ inches; weight 25–30 pounds. Shape oblong, depressed at base and apex; ribbed moderately wide; furrows very deep and prominent, especially at base and apex; surface wrinkled and slightly warted. Skin covered with a coarse lace-like color pattern of bright green (cress green) and between the ribs with irregular blotches of dark green (dull greenish black); ground color within the mesh is pale yellow (margarite yellow) changing to bright yellow (cadmium yellow) during storage. Fruit stalk long and heavy, 5–6 inches, curved and slightly twisted, deeply furrowed. Shell soft and thick, $\frac{1}{4}\text{--}\frac{3}{8}$ inch, variable. Flesh thick, $1\frac{1}{2}\text{--}2$ inches; texture coarse, very fibrous, rather tough, wet; insipid; quality very poor; color pale buff (cream color).

Seed medium size; medium long, narrow and moderately flat, $1.95 \times .99 \times .27$ cm. (128 per oz.); face smooth, dull white (cartridge buff); margin very slightly swollen, slightly fuzzy.

Small Sugar. Refs. 14, 21, 24, 26, 27, 32, 33, 41, 45, 50, 51, 59, 64, 73, 74, 75, 96, 121, 129, 130. Syns Boston Golden Sugar, Boston Pie, Early Small Sugar, Early Sugar, Golden Sugar, Mothers Famous Pie, New Boston Golden Sugar, New England, New England Pie, New Yellow Sweet Potato Pie, Pie, Prolific Sugar, Red Sugar, Rhode Island Sweet, Small Sweet Sugar, Small Yellow Sugar, Sugar, Sugar Pie, Sugar Sweet, Sweet, Yellow Sugar, Yum Yum.

This is the noted New England Pie Pumpkin grown throughout the Northeastern section of the country for use during the fall and at Thanksgiving time in making pumpkin pie. A familiar sight in the fall is the fields where the corn stalks have been cut and stacked, with the ground liberally spotted with golden yellow pumpkins that have grown unnoticed in the corn rows. This, the smallest of the pumpkins, is one of the sweetest and finest grained sorts and is also an excellent keeper.

Described by Burr in 1863, it continues to be the most popular of the "Punkins."

This variety attained maturity at Geneva in 100 days, 5 days earlier than Winter Luxury, 20 days earlier than Connecticut Field and 5 days later than Omaha. The vines are slightly less vigorous than those of Winter Luxury, have leaves slightly less cut and flowers which are slightly smaller and darker orange in color. The fruits are slightly smaller, distinctly more furrowed and much darker in skin color, with flesh which is finer grained, slightly thinner but darker orange in color.

Plant trailing; vines moderately slender, medium vigor, 8–10 feet, predominantly pale green, sparsely streaked with dark green; branches moderately many, basal. Cotyledons moderately short and medium broad; oval; apex moderately tapered; veining moderately prominent; color medium green. Leaves moderately small, 10×14 inches, broadly five-parted; sinus narrow, rounded at the base; shallow sub-sinuses occasionally present on terminal lobe; margin slightly incised near the base, otherwise serrate, slightly frilled; surface smooth; color moderately dark green; petiole medium long and moderately slender, 12–15 inches. Flower — pistillate, moderately large, $6\frac{1}{2}$ inches, orange; ovary globular, pale yellow (margarite yellow) striped and laced with pale green; sepals very short and very slender, $\frac{1}{4}$ inch; — staminate, large, 7 inches across; sepals moderately short and very heavy, $\frac{3}{4}$ inch; pedicel moderately short, 7–8 inches.

Fruit very small, $5\text{--}6 \times 7\text{--}8$ inches; weight 5–6 pounds. Shape nearly globular, flattened at base and apex, also somewhat depressed; ribbed narrowly; furrowed shallowly; surface wrinkled, somewhat obscurely pock-marked; blossom scar prominent, corky, $1\text{--}1\frac{1}{4}$ inches in diameter. Skin color reddish orange (xanthine orange to orange rufous) spotted with dull yellow (yellow ochre) pock-marks, entire fruit usually finely specked with minute dark brownish dots (mikado brown). Fruit stalk moderately long, 4–5 inches, slightly curved, furrowed. Shell moderately hard and thin, $\frac{1}{8}$ inch, dull orange (ochraceous orange); flesh moderately thick, $1\frac{1}{4}\text{--}1\frac{1}{2}$ inches; texture fine, tender, moderately dry; moderately sweet, quality good; color orange (deep chrome to capucine orange). Seed cavity medium size; placental tissue abundant, rather moist, stringy, often with a prominent core, rather easily removed.

Seed medium size; medium long and broad, moderately plump, $1.7 \times .98 \times .37$ cm. (156 per oz.); face smooth, dull white (cartridge buff); margin wedge-like.

Striped Field. Ref. 24.

This was listed and described by Burr in 1863, but not generally carried in catalogs. The plants were similar in growth habit to those of Connecticut Field, but the fruits were usually slightly smaller.

Fruits nearly globular to slightly oblong; skin color yellow, striped and variegated with green, which, during storage, assumes softer and paler green and deeper yellow; flesh moderately thick, rather coarse, moist, insipid, yellow color; quality poor.

Summer Crookneck. Refs. 14, 19, 20, 24, 26, 27, 28, 34, 37, 46, 47, 48, 49, 50, 52, 59, 61, 64, 67, 73, 88, 89, 95, 98, 99, 100, 101, 115, 116, 117, 120, 121, 125, 129, 130, 132, 136, 137. Syns. Bush Summer Crookneck, Bush Summer Warted Crookneck, Crookneck, Dwarf Summer Crookneck, Early Bush Summer Crookneck, Early Golden Crookneck, Golden Bush, Golden Summer Crookneck, Long Yellow Crookneck, Summer Golden Crookneck, Yellow Bush Crookneck, Yellow Crookneck.

The name Summer Crookneck appeared in our earliest garden seed catalogs, among them that of Thor-



SMALL SUGAR

Three-fourths natural size



burn in 1828, Hovey, 1834, and Breck, 1838. The variety from that time on has been listed in practically every catalog issued. There have been many changes in the name but the type has remained the same. Sturtevant says, "Notwithstanding its peculiar shape and usually warted condition, it does not seem to have received much mention by the early colonists." It has been an important variety although it has seemed to experience periods of fluctuation in its popularity.

First edible fruits were produced at Geneva in 55 days, 5 days earlier than Giant Summer Crookneck, in season with English Vegetable Marrow and 5 days later than Earliest Prolific. The plants are less vigorous than those of Giant Summer Crookneck, have leaves which are much less blistered and pistillate flowers with smaller, more distinctly crooked ovaries. The mature edible fruits are distinctly smaller, more abruptly enlarged at the tip, more severely crooked, and more uniformly and darker orange yellow.

Plant bush; central stem moderately coarse, heavy, very dark green, moderately vigorous; branches moderately few, basal; spread 3-3½ feet. Cotyledons short and medium broad, 1¾ x 1½ inches; nearly round; apex rounded; veining moderately prominent; color moderately grayish green. Leaves medium large, 12 x 14 inches, broadly five-lobed; sinuses narrow and rounded at the base; margin slightly incised near the base, otherwise dentate; surface rather rough, slightly blistered; color dark glossy green; petiole medium long and moderately heavy, 15-16 inches. Flower — pistillate, medium large, 5 inches across, orange; ovary club-like, constricted and curved near the base; sepals very short and slender, ¼ inch; — staminate, medium large, 5½ inches; sepals moderately short and heavy, ¾ inch; pedicel short, 5-6 inches.

Fruit mature edible stage 8-9 inches long, 2¾-3 inches in diameter at the apex and 1-1¼ inches at the base; shape club-like, distinctly curved between base and medial, abruptly enlarged, bulbous at the apex; ribbed very narrowly and irregularly; furrows moderately deep; surface warted. Skin color golden yellow (apricot yellow). Interior pale yellowish white. Mature fruit very small, 9-10 inches long, 3¾-4 inches in diameter at the apex and 1½-1¾ inches at the base. Shape much the same when mature edible; surface very rough, with warts and corrugations more accentuated. Blossom scar with button ⅝-½ inch in diameter, slightly extended. Skin color deep orange (orange) over the whole fruit. Fruit stalk short and slender, 1-1½ inches, slightly curved and twisted, shallowly furrowed, expanded at attachment. Shell thick, ⅛-¼ inch, variable, hard and woody, pale orange (antimony yellow) layer between shell and flesh. Flesh thin, ¼-⅜ inch at medial and apex, solid at base; texture moderately fine, somewhat granular, soft, cream color (buff yellow).

Seed small; short, broad and moderately flat, 1.23 x .74 x .25 cm. (464 per oz.); face moderately smooth, dull white (light buff); margin wedge-like.

Table Dainty. Refs. 74, 75, 76.

This variety produces fruits very attractive and distinctive and is used in this country by those who are familiar with the English marrows. It was introduced by Sutton & Sons of Reading, England, in 1909, and has remained as one of the most popular varieties in its group.

It is a small prolific sort very much shorter and more symmetrical than Cocozelle. The striping is, however, similar to some strains, particularly that of Italian Rapid Bush.

Plant trailing; vines moderately slender, very vigorous, 18-20 feet; branches many, basal and medial.

Fruit mature edible stage very small, 6-7 x 3-4 inches; weight 1½-1¾ lbs. Shape short cylindrical, very uniform and symmetrical, full at base and apex; surface smooth. Skin color alternate stripes of dark green (dull greenish black) and pale green (cress green) with the latter in the form of lace-like pattern, between the mesh of which is a buff (barium yellow) under color; after storage the pale green is replaced by golden yellow. Shell soft and thin. Interior nearly solid. Mature fruits slightly larger and develop color changes as noted above; flesh coarse and moist, poor quality.

Table Queen. Refs. 33, 41, 73, 83, 84, 87, 129. Syns. Acorn, Danish, Danish Table Queen, Des Moines, Des Moines Market, Individual, New Acorn, Queen Anne, Yama.

This variety of comparatively recent introduction into seed trade lists has rapidly gained prominence and is now found in the markets throughout the country. The introduction of this variety has completely revived the use of the small fall squash and other varieties similar in growth habit and use which were popular 40 years ago.

The Iowa Seed Co., Des Moines, Iowa, in their catalog of 1913 listed and showed an excellent illustration of Table Queen, and predicted that it would become a favorite in years to come. The earlier history of the variety is uncertain but no evidence has been put forward to dispute the claim that it was first grown commercially in the region about Des Moines. The name Danish squash was used on the market, but there is no evidence that the variety came from that country. On the contrary, Geo. F. Will of Bismarck, North Dakota, has reported that the Arikara tribe of Indians "grew a black heart-shaped squash very similar in appearance to Table Queen but not its equal in quality." At the time of its introduction there had been in cultivation for many years several varieties of the running fall squash (pepos). The exact history of all of these is missing. Apparently they arose unheralded and the fact that they were in a fairly staple form when introduced would indicate that they had existed for a long time.

Strains with both golden yellow and ivory colored fruits exist but the typical dark green colored squash is the only form as yet popularized. Several times the name White Table Queen has been listed but it has never become commercially important.

The variety attained maturity at Geneva in 86 days, which was in season with Fordhook and Perfect Gem, and 6 days later than Delicata. The vines are more vigorous than those of Delicata, have larger leaves which are much more deeply lobed and distinctly darker green in color. The flowers are slightly larger with distinctly larger and broader sepals in the pistillate forms.

Plant trailing; vines slender, moderately vigorous, 12-15 feet; branches many, basal and medial. Cotyledons very short and narrow, 1⅝ x 1⅞ inches, short oval to nearly round; apex rounded; veining prominent, color dark grayish green. Leaves small, 10 x 12 inches, broadly five-lobed; sinuses narrow, rounded at the base, 2-4 sub-sinuses on terminal lobe; margin denticulate, slightly frilled; surface occasionally somewhat blistered; color dark green; petiole short and slender, 10-12 inches. Flower — pistillate, medium large, 5-5½ inches across, pale orange; ovary turbinate, ridged; sepals medium long and moderately slender, 1¼-1½

inches, somewhat leaf-like;—staminate, medium large, $5\frac{1}{2}$ inches across; sepals medium long, $1\frac{1}{4}$ inches, small leaf-like terminations present; pedicle short, 5–6 inches.

Fruit very small, $5-6 \times 4-4\frac{1}{2}$ inches; weight $1\frac{1}{4}-1\frac{3}{4}$ pounds. Shape turbinate, tapering rather abruptly from the medial to the apex; ribbed widely; furrowed deeply; surface smooth; blossom scar with button, $\frac{1}{4}$ inch in diameter, slightly extended. Skin color very dark green (deep dull blackish green) during storage changing to dull orange (zinc orange), somewhat diffused with dull green. Fruit stalk moderately short and slender, 2–3 inches, curved and often twisted, ribbed. Shell hard and thin, $\frac{1}{16}$ inch. Flesh thin, $\frac{5}{8}-\frac{3}{4}$ inch, thickest at the base and medial, texture firm, tender, moderately dry, often rather fibrous; good flavor and moderately sweet; color pale orange (orange buff to light orange yellow); quality good. Seed cavity moderately large, conforms to fruit shape; placental tissue medium, moist, rather fibrous, moderately easy to remove.

Seed small; short, broad and medium plump, $1.36 \times .83 \times .30$ cm. (284 per oz.); face smooth, dull white (cartridge buff); margin wedge-like.

Tender and True. Refs. 74, 75.

This marrow, introduced as a novelty in 1907 by Sutton & Sons, Reading, England, belongs to the semi-trailing class and produces abundantly its prettily mottled fruits. The fruits of this variety are similar to those of Epicure in the mature edible stage, although somewhat more nearly globular and deeper green in color. At the mature stage these two are distinct in shape, color and surface markings.

Plant semi-trailing; vines medium vigor, short; branches few. Leaves very small, 8×9 inches, rather deeply five-cleft, medium green, occasionally blotched with gray; margin dentate, slightly frilled.

Fruit mature edible stage very small, $4-5 \times 5-6$ inches, weight $2\frac{1}{2}-3$ pounds. Shape nearly globular, distinctly flattened at base and apex; ribbed widely, furrowed moderately deep at base and apex; surface otherwise smooth. Skin color usually striped very narrowly with (dull blackish green) and alternately striped with $\frac{1}{4}$ inch bands of pale greenish yellow (barium yellow) in the form of a lace-like pattern, through the mesh of which pale yellow appears. Shell soft and thin. Interior nearly solid. Mature fruits slightly larger and the colors more intense, otherwise much the same.

Tours. Refs. 14, 21, 27, 32, 33, 41, 50, 73, 101, 125, 129, 130, 137. Syns. Citronille, French Tours, Jumbo Squash, Large Touraine, Large Tours, Mammoth French, Mammoth Tours, Touraine.

This large pumpkin, used chiefly for stock feed, was named for the district in France where it supposedly originated. Peter Henderson & Co. of New York listed the variety in 1873 and the large size of the fruits proved to be an adequate incentive to keep it in cultivation for a number of years.

Mature fruits were produced at Geneva in 125 days, in season with Sandwich Island and 5 days later than Connecticut Field. The vines are decidedly more vigorous than those of Connecticut Field, have much larger and more crumpled leaves, more profusely blotched with gray. The flowers are much larger, more prominently veined and streaked with pale yellow. The fruits are considerably larger, more oblong, and exceedingly more variable in color.

Plant trailing; vines very coarse and heavy, very vigorous, 20–25 feet; branches many, basal and medial. Cotyledons very long and very broad, $4\frac{1}{2} \times 2\frac{1}{2}$ inches, long oval; apex rounded;

veining moderately prominent; color medium green. Leaves very large, 14×18 inches, rather deeply and broadly five-lobed; sinus narrow, rounded at the base; sub-sinuses shallow, on all lobes; margin incised near the base, otherwise serrate, slightly frilled; surface crumpled, often coarsely blistered; color dark green, often marked with irregular gray blotches along the veins or at the intersections with the veinlets; petiole medium long and very heavy, 12–15 inches. Flower—pistillate, very large, 8 inches across; corolla orange, prominently marked at the base and along the veins of the petals with pale yellowish white; ovary light green lacing, regularly and narrowly striped with moderately dark green and speckled with pale yellow; sepals very short and moderately slender, $\frac{1}{4}-\frac{3}{8}$ inch;—staminate, very large, $8\frac{1}{2}-9$ inches across, colored similarly to pistillate flowers; sepals moderately short and very heavy, $\frac{3}{4}-\frac{1}{2}$ inch; pedicle moderately long, 8–10 inches.

Fruit very large, $20-24 \times 15-18$ inches; 30–35 pounds. Shape oblong, somewhat irregular, often somewhat flattened at base and apex; ribbed medium narrow; furrows moderately shallow; surface rather smooth, somewhat bumpy and uneven; blossom scar depressed, $\frac{1}{2}-1$ inch in diameter. Skin color variable, predominantly dark green (dull blackish green) in the form of a coarse, irregularly laced pattern, striped pale orange yellow (orange buff) to conform with the most prominent depressions. The green occurs in broad stripes 3–4 inches wide which contain numerous small, angular (orange buff) blotches. Some fruits are (cream color) to a light grayish green (light bice green) lace pattern with (glass green) mesh. Fruit stalk moderately long and heavy, 4–5 inches, slightly curved, rough, ridged, woody and tough, expanded at attachment. Shell soft and moderately thick, $\frac{1}{8}-\frac{1}{4}$ inch. Flesh moderately thick, $1\frac{1}{4}-1\frac{1}{2}$ inches, very coarse, tough, stringy, wet; slightly sweet, quality very poor; color pale amber (maize yellow). Seed cavity very large, conforms to fruit shape; placental tissue comparatively little, rather dry, easily removed.

Seed large, long, narrow and moderately plump, $2.5 \times 1.47 \times .36$ cm. (96 per oz.); face very finely wrinkled to nearly smooth, distinctly compressed, dull white (cartridge buff); margin very distinct, distinctly ridged, rounded and swollen, smooth.

Variegated Bush Scalloped. Ref. 24, 50, 101. Syns. Improved Variegated Custard Marrow, Variegated Patty Pan.

Burr in 1863 describes this squash very briefly as “pale yellow, or nearly white, variegated with green, handsome but of inferior quality.” Fruits of the variety are pictured in the 1883 edition of Vilmorin.

White Bush Scalloped. Refs. 14, 19, 20, 24, 25, 26, 27, 28, 32, 33, 34, 37, 41, 46, 48, 49, 50, 52, 59, 61, 64, 67, 73, 74, 75, 76, 88, 89, 91, 94, 95, 98, 100, 101, 115, 116, 120, 129, 130, 132, 137. Syns. Arlington White Bush Scalloped, Cylinder Squash, Cymbaling, Dollar Squash, Dow's Extra Early White Bush, Dwarf White Bush, Earliest White Bush, Early Bush Scalloped, Early Dawn, Early White Bush, Extra Early Bush, Extra Early Dawn, Extra Early Jersey White Bush, Extra Early Patty Pan, Jersey White Bush, Light White Bush, Perfection Bush Scalloped Patty Pan, Silver Custard, Superba White Bush, White Patty Pan.

The form of *Cucurbita* now generally known as Bush or Summer squash was one of the first vegetables which the early explorers and settlers noticed in use by the Aborigines. The word squash seems to have been derived from “askuta-squash” or “squonter-squashes” and it is now generally thought that the name applied



SUMMER CROOKNECK

Two-thirds natural size



TABLE QUEEN

to what we now call summer squash. The fruits were called "quaasiens," "Sitroules," "symnels," or "cimnells." Robert Beverley in his "History of Virginia" in 1722 speaks of the shield-shaped or clypeate kinds and says that they are sometimes called cymnells, from the Lenten cake of that name, which many of them very much resemble. He adds that the northern Indians call them squash or squanter-squash.

While in most sections they are called Scallop squash, yet in certain localities they are known as Patty-pans, a word derived from their resemblance to a crimped pan used in the kitchen for baking pies. In Sturtevant's Notes there are many citations to the Bush or Summer Squash indicating that they were known in Europe in the Sixteenth Century. They have, because of earliness, always been a popular sort and their use is increasing, especially when taken in the very young stages of fruit development.

First edible fruits were produced at Geneva in 56 days, 4 days earlier than Yellow Bush Scallop, and 2 days later than Long Island White Bush. The plants are slightly more vigorous than those of Long Island White Bush and have slightly larger leaves. The pistillate flowers are larger and have ovaries which are decidedly more deeply scalloped. The mature edible fruits are much more irregular and deeply scalloped, and retain the white skin color much longer after full maturity.

Plant bush; central stem coarse, moderately vigorous, spread $3\frac{1}{2}$ -4 feet; branches moderately few, basal. Cotyledons moderately short and medium broad, $2\frac{1}{4}$ x $1\frac{1}{2}$ inches, oval; apex moderately rounded; color moderately dark green. Leaves moderately large, 12 x 15 inches, broadly five-cleft; sinus moderately deep, acute; margin slightly incised near the base, otherwise denticulate, slightly frilled; surface moderately blistered, occasionally somewhat crumpled; color dark glossy green; petiole long and heavy, 18-20 inches. Flower—pistillate, moderately large, 6 inches across, orange; ovary disk-like, very deeply scalloped; sepals very short and very slender, $\frac{1}{4}$ inch;—staminate, large, 7 inches across; sepals medium long and slender, 1 inch; pedicel short, 6-7 inches.

Fruit mature edible stage $2\frac{1}{2}$ -3 x 5-7 inches; shape disk-like, ribbed widely; furrows deep; surface wrinkled, occasionally somewhat warted; skin color nearly white. Mature fruits very small, $3\frac{1}{2}$ x $7\frac{1}{2}$ -9 inches; weight $2\frac{1}{2}$ -3 pounds. Shape broad, bowl-like, very prominently marked with large projections about the periphery of the medial, usually perpendicular to the stem, but often turned towards the base; surface nearly smooth, occasionally slightly warted, very shallowly creased to conform with stem ridges; skin color white; fruit stalk moderately short and slender, $2\frac{1}{2}$ -3 inches, slightly curved, shallowly furrowed, expanded at attachment. Shell hard, brittle and thin, $\frac{1}{8}$ inch creamy white (cartridge buff).

Seed moderately small; moderately short, moderately broad and moderately flat, 1.42 x .77 x .24 cm. (296 per oz.); face smooth, very pale, glossy yellowish buff (pale ochraceous salmon); margin wedge-like.

White Summer Crookneck. Refs. 33, 41, 64, 73, 129, 130. Syns. Cream-colored Crookneck, Early White Crookneck, Giant White Summer Crookneck.

This rather beautiful summer Crookneck was introduced in 1895 by the originators, D. M. Ferry & Co., of Detroit, Michigan. Its parentage is unknown but

it was said to have resulted from a cross made on the Ferry farms. The variety is listed by a few firms today but in general a Crookneck with some yellow color is preferred.

The fruits of this variety resembled those of Summer Crookneck in all respects except in color of skin, which was an ivory white over the entire surface.

Winter Luxury. Refs. 17, 26, 27, 28, 31, 33, 38, 73, 90, 97, 115, 121, 130. Syns. Golden Russet, Livingston's Pie Squash, Luxury Pie, New Pie, New Winter Luxury, Pie, Queen, Queen Luxury, Standard Pie, Winter Queen.

This pumpkin of high quality was introduced independently as Winter Luxury in 1893 by Johnson & Stokes of Philadelphia and as Livingston's Pie Squash in 1894 by A. W. Livingston's Sons of Columbus, Ohio. Livingston reported having found it in the garden of one of his farmer customers who had grown it many years. The fine and close netting resembled that found on some muskmelons and the beautiful golden yellow color caused some to note its general color resemblance to the russet apple.

Gill Bros., Portland, Oregon, in 1920 offered Orange Winter Luxury with fruits which compared with the original with the exception of the general ground color which was of a rich orange instead of the lighter lemon yellow. This strain has gradually replaced the old and is that described below.

Winter Luxury matured at Geneva in 105 days, which was 15 days earlier than Connecticut Field and 5 days later than Small Sugar. The vines are somewhat more vigorous than those of Small Sugar, have leaves which are somewhat more cut and flowers which are larger and paler orange in color. The fruits are slightly larger, much less furrowed and somewhat lighter in color, while the flesh is thicker but lighter orange in color.

Plant trailing; vines slender, moderately vigorous, 10-12 feet long, very dark green at the base; branches moderately many, basal. Cotyledons moderately long and moderately broad, $2\frac{1}{2}$ x $1\frac{3}{8}$ inches; long oval; apex moderately rounded; color moderately light green. Leaves moderately small, 11 x 14 inches, broadly five-lobed, moderately deep; sinuses rounded at the base; margin rather deeply incised near the base of the blade, remainder serrate, very slightly frilled; surface smooth and occasionally slightly crumpled; color dark green; petiole medium long and slender, 10-12 inches. Flower—pistillate, medium size, 5-6 inches across, yellow; ovary globular; sepals short and moderately slender, $\frac{3}{8}$ inch;—staminate, medium size, 6-6 $\frac{1}{2}$ inches across; sepals medium long and heavy, $\frac{3}{4}$ inch; pedicel moderately short, 8-9 inches.

Fruit moderately small, 6-7 x 9-10 inches; weight 7-8 pounds. Shape nearly globular, distinctly depressed at base and apex; ribbed rather narrowly; furrows shallow; blossom scar depressed, somewhat corky, $1\frac{1}{2}$ - $1\frac{3}{4}$ inches in diameter; surface uniformly and finely laced with a light gray (cartridge buff), very shallow, cork-like netting; skin color orange (ochraceous orange to zinc orange). Fruit stalk long and moderately slender, 5-6 inches, slightly curved, rough, moderately deep-ridged, woody and tough, slightly expanded at attachment. Shell moderately hard and thin, $\frac{1}{16}$ - $\frac{1}{8}$ inch. Flesh moderately thick, $1\frac{1}{2}$ - $1\frac{3}{4}$ inches, thickest at the medial; texture moderately fine, slightly juicy, tender; slightly sweet, quality good; color pale orange (ochraceous buff). Seed cavity moderately large; placental tissue moderately moist, tender and easily removed.

Seed moderately small, moderately short, medium width and flat, 1.16 x .86 x .21 cm. (248 per oz.); face smooth, dull white (cartridge buff); margin wedge-like.

Yellow Bush Scallop. Refs. 6, 14, 24, 26, 27, 32, 33, 41, 47, 48, 50, 52, 61, 64, 67, 73, 74, 75, 89, 101, 125, 129, 130, 132, 136, 137. Syns. Custard Marrow, Custard Vegetable Marrow, Early Golden Bush, Early Golden Custard, Early Yellow Bush Scallop, Gold Bush, Golden Bush, Golden Scallop, Lemon Scallop Bush, Yellow Elector's Cap, Yellow Patty Pan, Yellow Summer Scallop.

This, the companion variety to White Bush Scallop, has been mentioned in the earliest variety records available. Its use has not been as general as that of the white form and consequently it is not mentioned as often. Burr in 1863 considered the White to be a sub-variety of Early Yellow Bush but no definite record which would establish the relative age of the two sorts is available. Since the "shield shaped or clypeate kinds" were mentioned by Robert Beverly¹ it is probable that the separate colors were then known and grown by the Indians. Although found in some catalogs prior to 1860, it was not until after that date that both the white and yellow scallops were commonly listed.

First edible fruits were produced at Geneva in 60 days, in season with Giant Summer Crookneck, 4 days later than White Bush Scallop and 7 days later than Golden Custard. The plants are less vigorous than those of Golden Custard, have slightly smaller leaves which are darker green, smoother, less glossy, and have darker colored, more slender petioles. The mature edible fruits are smaller, thicker and decidedly more regularly scalloped.

Plant bush; central stem coarse and heavy, medium vigor, spread 3-3½ feet; branches few, basal and medial. Cotyledons moderately short and moderately narrow, 2 x 1¼ inches, oval; apex moderately rounded; veining prominent; color rather grayish green. Leaves medium large, 10 x 15 inches, broadly five-cleft; sinuses narrow and acute; margin partly incised near the base, otherwise serrate, slightly frilled; surface rough, slightly crumpled; color moderately dark green, occasionally somewhat glossy; petiole medium long and moderately heavy, 14-16 inches, moderately dark green. Flower—pistillate, medium large, 5 inches across, orange; ovary thickened, disk-like; sepals very short and slender, ⅜ inch;—staminate, medium large, 5½ inches across; sepals medium long and heavy, 1¼ inches; pedicel very short, 4-5 inches.

Fruit mature edible 2-3 x 6-7 inches; shape disk-like; ribbed widely, furrows deep; surface smooth; skin color deep yellow (lemon chrome) irregularly mottled with pale yellow (citron yellow). Interior yellowish white, solid. Mature fruit very small, 3-4 x 8-9 inches; weight 3-4 pounds. Shape thickened disk-like, base slightly rounded, nearly flat, apex and part of medial shallowly rounded, extreme apex slightly depressed, medial rather regularly scalloped about the periphery, pointed towards the base; surface nearly smooth, very sparsely warted; blossom scar very large, conspicuous, 2-2½ inches in diameter, depressed, surrounded by a corky ring, somewhat irregular in outline. Skin color light orange (capucine yellow) indistinctly and irregularly mottled with paler orange (cadmium yellow) largely conforming with the furrows between the scallops. Fruit stalk short and moderately slender, 1½-2 inches slightly curved, hard and woody, ridged. Shell very hard, brittle and thin ⅛-⅓ inch, pale orange yellow (antimony yellow). Flesh

fibrous structure, medium coarse, soft, thin at the base and medial, ⅝-¾ inch, solid at the scallops, creamy buff (cream color).

Seed moderately small; moderately short, moderately broad and moderately flat, 1.44 x .90 x .25 cm. (284 per oz.); face smooth, dull yellowish buff (pale ochraceous salmon); margin wedge-like.

Zucchini. Refs. 33, 73, 86, 129. Syns. Italian, Spanish Squash.

In this country the variety name Zucchini seems to have been used first in California for it was listed by both Germain Seed Co. and by Aggeler & Musser of Los Angeles, California, about 1921. Since 1932 it has been found occasionally in catalogs of eastern seed houses, and now represents a very definite type.

In 1934 D. V. Burrell of Rocky Ford, Colorado, introduced Grey Zucchini. At Geneva this strain was intermediate in color between Boston Greek and Zucchini. In other respects the two were much the same.

First edible fruits were produced at Geneva in 53 days, 2 days earlier than Italian Vegetable Marrow, in season with Moore's Cream and 1 day later than Boston Greek. The plants are considerably less vigorous than those of Italian Marrow and have leaves which are much smaller, decidedly more cut and blotched with gray. The pistillate flowers are slightly smaller and have less cylindrical ovaries. The mature edible fruits are very much the same as Boston Greek in size and shape, but are distinctly darker green in color.

Plant bush; central stem moderately heavy, dark green; branches moderately many, basal and medial, medium vigor. Cotyledons moderately long and moderately broad, 2¾ x 1⅝ inches; long oval; apex tapered; color light green. Leaves small, 9 x 10 inches, narrowly five-cleft having many sub-sinuses; sinuses very deep, slightly lacerated; margin incised, distinctly and finely frilled; surface moderately smooth; color dark dull green, profusely marked with small gray blotches along the midribs and intersections with the veinlets; petiole moderately long and slender, 14-16 inches. Flower—pistillate, medium size, 5-5½ inches across, orange; ovary somewhat club-like; sepals short and slender, ¼ inch;—staminate, medium size, 5-5½ inches across; sepals moderately short and moderately slender, ¾ inch; pedicel moderately short, 7-8 inches.

Fruit mature edible stage 10-12 inches long, 2½-3 inches in diameter at the apex; shape somewhat cylindrical, slightly enlarged at the apex; surface smooth, blossom scar small, slightly extended. Skin color effect moderately dark green; ground color pale yellow (ivory yellow) profusely and heavily marked with very dark green (dull greenish black) lace-like color pattern over the entire fruit; concentrated to form narrow, distinct, nearly solid dark green stripes which conform to the ridges at the base of the fruit. Fruit stalk short and thick, 1 inch, deeply ridged and expanded at the point of attachment; marked with a dark green lace-like color pattern similar to that on the fruit. Shell soft, thin. Flesh thin, ½-¾ inch, moderately fine texture, slightly stringy in older fruits, quality good; color pale greenish white (sea foam green). Mature fruit 12-14 inches long, 3½-3¾ inches at the base and 4½-4¾ inches at the apex; weight 4½-6 pounds. Shape same as during mature edible stage. Color creamy yellow (warm buff) with a lace-like color pattern of pale orange (capucine orange). Flesh ¾-1 inch thick, pale creamy yellow (buff yellow) very coarse; seed cavity large, conforms to fruit shape; placental tissue abundant, coarse, stringy and difficult to remove.

Seed moderately small; moderately short, medium width and thickness, slightly inflated, 1.58 x .90 x .35 cm. (184 per oz.); face smooth, dull white (pale olive buff); margin wedge-like.

¹Beverly, R. History of Virginia. 124. 1705.



WHITE BUSH SCALLOP

(Two-thirds natural size)



WINTER LUXURY

(Three-fourths natural size)

CUCURBITA MOSCHATA

Of the three species treated in this chapter, this one is the least popular in the northern states. As pointed out in the first chapter, this group is believed to be more closely allied to the original form from which the genus *Cucurbita* arose, and consequently is represented in a more diverse variation in the tropics. Certain types, among which were the Striped Crookneck and the Puritan, have been recorded in our eastern states from the time of the earliest colonies. Moreover, the Indians were known to have grown the Winter Crookneck along with forms of pepos. The Seminole Indians of Florida were likewise known to have used a variety which bears the name of this tribe.

Although the types of several modern varieties are recognized as being in existence in pre-colonial days, the dates are not known in many instances when the names were applied. The first authentic reference to a variety as we know it is in relation to Cheese, a variety listed by Thorburn in 1824. Canada Crookneck apparently was named and introduced about 1834 by Hovey. There were apparently two groups of Cushaws at or before this time. One line, which included Winter Crookneck, Canada Crookneck and Golden Cushaw, possessed the slightly furrowed, ridged and expanded peduncle. Other varieties possessing similar stem characteristics of this group included Quaker Pie, introduced in 1884, Calhoun in 1891 and Virginia Mammoth in 1895. The other group having a distinctly fleshy, thick, maxima-like peduncle included the Green Striped Cushaw, Puritan and Tennessee Sweet Potato introduced in 1883, Japanese Pie in 1884, and White Cushaw in 1891. The introduction of Yokohama in 1862 (followed by Chirimen, Kikuza and Saikyo some 50 years later) invites considerable interest as to how this type, so diverse from American sorts, was established in Japan.

This species is of the least economic importance of the three in the north and east. Some of its varieties are rather widely grown in the southern states and are acknowledged to be delightful. Twenty varieties are included in this account. Several obscure varieties, about which little is known, as well as a few varieties now grown in foreign countries, are also listed.

Bugle Gramma. Refs. 39, 40. Syns. Gramma, Trombone.

This is the most popular moschata grown in Australia and in type of fruit is quite similar to our Golden Cushaw. A number of the Cushaw pumpkins grown in the South are also grown in Australia and are used both as pie pumpkins and as food for stock.

This variety was the last to mature at Geneva, having required 145 days, 10 days later than Chirimen and 20 days later than Golden Cushaw. The vines are most like those of Chirimen and Kikuza and are decidedly more vigorous than those of Golden Cushaw, with leaves having more gray blotches and more distinct decurrent blades than those of the latter. The flowers are much larger, more brilliantly colored and have larger ovaries

and sepals. The fruits are considerably longer and more uniformly cylindrical at the base and medial.

Plant trailing; vines moderately slender, very dark green, very vigorous, 20–25 feet; branches many, basal and medial. Cotyledons medium long and medium broad, $2\frac{1}{2} \times 1\frac{1}{2}$ inches, nearly rectangular; apex rounded, slightly notched; veining prominent; color grayish green. Leaves medium large, 11×15 inches very shallowly 5-lobed, terminal one distinctly tapered; distinctly decurrent; margin slightly serrated at the base otherwise very finely denticulate, slightly frilled; surface moderately smooth, occasionally somewhat coarsely blistered; auricles distinctly imbricate, ascending, vertically parallel; color very dark green, moderately marked with small gray blotches at the intersections; petiole moderately long and moderately slender, 15–18 inches, very dark green. Flower — pistillate, very large, $8\frac{1}{2}$ inches across, pale orange often streaked with creamy white; ovary very large, crooked, enlarged at the apex, pale green, irregularly streaked and spotted with pale yellow; stigma very prominent, compact, deep orange red; petals terminate in green tip $\frac{1}{2}$ inch long; sepals very long and broad, $2-2\frac{1}{2}$ inches, often with leaf-like appendages; — staminate, moderately large, 6 inches across; sepals moderately long and very broad, $1\frac{1}{2}-1\frac{3}{4}$ inches, fuzzy; pedicel moderately long, 9–10 inches, often very much longer, extending above the foliage.

Fruit large; 26–30 inches long, 8–10 inches in diameter at the apex and 4–5 inches at the base and medial; weight 20–25 pounds. Shape crookneck, with extreme apex abruptly bulbous, with base and medial a curved cylinder; moderately ribbed; furrows shallow; surface wrinkled, leather-like; blossom scar with button $\frac{1}{4}$ inch long, surrounded by a cork-like scar $\frac{3}{4}-1\frac{1}{4}$ inches in diameter. Skin color light brown (mars yellow to ochraceous tawny) covered with a heavy bloom. Fruit stalk moderately long and medium heavy, 4–5 inches, curved, moderately furrowed, very spiny, woody and tough, expanded at base. Shell soft and medium thick, $\frac{1}{8}$ inch. Flesh medium thick at apex, $1-1\frac{1}{4}$ inches, solid at medial and base; texture coarse, juicy, very fibrous; distinctly sweet, pale salmon orange (capucine orange); quality poor. Seed cavity small, at apex; placental tissue little, stringy, salmon pink, moderately moist, difficult to remove.

Seed medium large; medium long, moderately narrow and moderately flat, $1.86 \times .96 \times .28$ cm. (184 per oz.); face rather rough and wrinkled (tilleul buff); margin slightly swollen, crinkled and fuzzy, brown (fawn).

Calhoun. Refs. 15, 28, 31, 33, 41, 64, 129, 130. Syns.

New Thanksgiving Pumpkin, Thanksgiving Pie.

This was originated by a Mr. Calhoun and was introduced in 1891 by Peter Henderson & Co. of New York. It undoubtedly was a selection from Cheese for it is similar to that variety in many respects. This variety has been popular in the Middle West where it has been grown as Thanksgiving Pie.

Mature fruits were produced at Geneva in 110 days, in season with Cheese and 10 days earlier than Quaker Pie. The vines are considerably less vigorous than those of Cheese, have leaves which are more profusely blotched with gray and have slightly smaller flowers with more globular ovaries. The fruits are practically the same color but are considerably smaller and thicker.

Plant trailing; vines very slender, moderately light green, medium vigor, 8–10 feet; branches many, basal and medial. Cotyledons medium long and moderately narrow, $2\frac{3}{4} \times 1\frac{1}{4}$ inches; rectangular; apex rather truncate; veining prominent; color moderately pale grayish green. Leaves small, 8×11 inches, nearly entire; auricles moderately decurrent; margin distinctly serrated and incised near the base, otherwise denticulate; surface smooth; color moderately dark green, profusely marked with small, gray blotches along the veins and at the intersections of the veinlets; petiole moderately short and slender, 12–14 inches; spines very many, moderately long and slender. Flowers — pistillate large, $7-7\frac{1}{2}$ inches

across, orange; ovary balloon-like, pale green, mottled and spotted with pale yellow; sepals medium long and moderately heavy, $1\frac{1}{4}$ inches, leaf-like at the tip;—staminate medium large, $5\frac{1}{2}$ –6 inches across; sepals moderately long and heavy, $1\frac{1}{2}$ inches, leaf-like at the tip; pedicel moderately short, 7–8 inches.

Fruit small, 6–7 x 9–10 inches; weight 8–10 pounds. Shape nearly globular, flattened much at base and apex, slightly depressed at both ends; ribbed widely; furrows moderately shallow; surface smooth; blossom scar $\frac{3}{4}$ –1 inch in diameter, depressed and blackened. Skin color consists of a uniform lace-like pattern of cream (cinnamon buff) over the entire surface, through the mesh of which shows a ground color of pale cream (pale ochraceous buff). Fruit stalk medium long 3–4 inches, slightly curved, moderately furrowed, woody, tough, and decidedly expanded at the base. Shell moderately soft and thin, $\frac{1}{16}$ inch. Flesh moderately thick, $1\frac{1}{4}$ – $1\frac{1}{2}$ inches, slightly thinner at the apex; texture very coarse, fibrous, juicy and rather tough; moist, sweet; color pale orange salmon (capucine orange). Seed cavity moderately large; placental tissue very abundant, moist, tough, very coarse and fibrous, cord-like, very difficult to remove.

Seed medium size; medium length and medium breadth, moderately flat, 1.7 x .93 x .23 cm. (216 per oz.); face rather rough and scaly, buff (tilleul buff); margin rounded, crinkled and stringy; brownish (fawn color).

Canada Crookneck. Refs. 14, 24, 26, 37, 42, 43, 44, 50, 59, 61, 64, 101, 102, 114, 130, 136, 137. Syns. Canada, Canadian Winter Crookneck.

The Crooknecks were, in early times, the chief winter squashes available and as such were of course very popular. This variety was one of the very earliest recorded by American seedsmen as it was listed by Hovey in 1834, by Breck in 1838 and Thorburn in 1840. Canada, one of the best of the Crooknecks, came to maturity about the same time as Autumnal Marrow and was much esteemed as a table vegetable.

This was the smallest of the cushaw group. The fruits were more uniformly cream colored and were finer grained than those of Winter Crookneck; also the plants had smaller leaves and a less vigorous vine growth.

Plant trailing; vines very dark green, slender, moderately vigorous. Leaves small, very dark green, moderately shallow, 5-lobed; blades decurrent; margin dentate.

Fruit small, 10–12 inches long, 5–6 inches in diameter at the apex; $1\frac{1}{2}$ –2 inches at the base and medial. Shape crookneck, with apex distinctly and abruptly swollen and the neck slender and distinctly curved; surface nearly smooth, slightly wrinkled, somewhat leatherlike. Skin color creamy-yellow, covered with a heavy bloom. Fruit stalk slender, tapering, expanded at the base, shallowly furrowed. Shell soft. Flesh thin at the apex, solid at base and medial; texture fine, dry; sweet, well-flavored; color orange to reddish salmon; quality good.

Seed small (300 per oz.); dull grayish white with fuzzy, rough, yellowish brown margin.

Cheese. Refs. 14, 19, 24, 28, 32, 33, 41, 42, 49, 50, 64, 73, 125, 129, 130. Syns. Big Cheese, Buff Pie, Family, Finest Cheese, Finest Yellow Family, Landreth Cheese, Large Cheese, Large Cheese Western Sweet, Large Mammoth Yellow Cheese, Large Sweet Cheese, Mammoth Cheese, Sweet Pumpkin, Thanksgiving, Thanksgiving Pie, West India Pumpkin, Yellow Family.

The name was apparently suggested because of the similarity in shape of the mature fruit to a cheese box.

It is one of the oldest varieties cultivated in America, having been listed as early as 1824 by Thorburn, 1826 by Sinclair and Moore, and in 1834 by Hovey. The cheese pumpkins are, as a group, quite different from other squash and pumpkins, and have remained remarkably stable. The group as a whole is characterized by having flesh of a deep salmon orange color. The Cheese pumpkins are hardy, productive, and much superior to most of the field grown sorts. It is largely grown for canning or stock feed and is well adapted to growing conditions as found in every part of the country.

At Geneva this variety matured in 110 days, in season with Calhoun, and 15 days earlier than Kentucky Field. The vines are very much like those of Kentucky Field, have leaves which are marked with smaller gray blotches and have longer and more slender petioles. The fruits are slightly smaller and much more uniform in color, particularly in the early mature stages, and have more uniform and thicker flesh.

Plant trailing; vines moderately slender, very vigorous, 15–18 feet long; branches moderately many, basal and medial. Cotyledons medium long and moderately narrow, $2\frac{1}{4}$ x $1\frac{1}{2}$ inches; long oval to rectangular; apex notched, truncate; veining prominent; color distinctly grayish green. Leaves shallowly lobed, medium size, 9 x 11 inches, blades moderately decurrent; margin slightly incised at the base of the blade, otherwise denticulate, slightly frilled; color moderately dark green, moderately marked with small, pale grayish green blotches at intersection of vein and veinlets; petioles moderately long and slender, 16–18 inches. Flower—pistillate, very large, 8 inches across, orange; ovary oblate, pale green, spotted with creamy white; sepals medium long and slender, 1 inch;—staminate, moderately large, 6–7 inches across; sepals moderately long, $1\frac{1}{2}$ inches, leaf-like, flattened, distinctly pubescent; pedicel moderately long, 9–12 inches.

Fruit medium size, $5\frac{1}{2}$ –6 x 12–14 inches; weight 10–14 pounds. Shape oblate, distinctly flattened and moderately depressed at base and apex; ribbed widely and furrowed shallowly; surface smooth. Blossom scar $\frac{3}{4}$ –1 inch in diameter, not prominent. Skin color dark cream (cinnamon buff) network over the entire fruit, having a slightly lighter cream ground color (cream color) within the mesh of the color pattern. Fruit stalk medium long, 3– $3\frac{1}{2}$ inches, curved, ridged, woody, tough and distinctly expanded at attachment. Shell medium thick, $\frac{1}{16}$ – $\frac{1}{8}$ inch and moderately soft. Flesh moderately thick at the base and medial, $1\frac{1}{4}$ – $1\frac{1}{2}$ inches, considerably thinner at apex, $\frac{1}{2}$ – $\frac{3}{4}$ inch; texture very coarse, fibrous, juicy, soft, tender; distinctly sweet; quality poor; color deep orange (zinc orange to salmon orange). Seed cavity large, contains much placental tissue which is moist, very fibrous and tough and difficult to remove.

Seed moderately small; moderately short and medium broad, moderately flat, 1.55 x .85 x .25 cm. (244 per oz.); face slightly rough, light brown (tilleul buff); margin distinct, wedge-like, fuzzy and dull brown (fawn color).

Chirimen. Refs. 33, 73. Syn. Japanese Winter Squash.

This moschata variety represents one of the most unique groups in the whole squash family in its fruit characters and habit of growth. When Aggeler & Musser Seed Co. of Los Angeles introduced it in 1922 it was said to have been “popular with the Japanese ever since their advent into California gardening.” The origin of the variety is unknown, although the fruits of the variety Yokohama introduced many years earlier have the same blister-like protuberances on the skin, an inference which may indicate close relationship. In California the variety has had limited use. It requires a



CHEESE

(Two-thirds natural size)



GREEN STRIPED CUSHAW

(One-half natural size)

long season and occasionally does not mature in New York State.

Mature fruits were produced at Geneva in 135 days, 5 days earlier than Kikuza and Saikyo and 20 days later than Japanese Pie. The vines are similar to those of Saikyo and Kikuza except that the gray blotches on the leaves are more numerous than they are on the latter two sorts. The leaves are decidedly darker green than those of Japanese Pie and are distinctly more decurrent, more like those of Bugle Gramma in this respect. The fruits are most like those of Kikuza although smaller than that variety, much more warted, pimpled and more narrowly ribbed.

Plant trailing; vines slender, dark green, very vigorous, 20-25 feet; branches many, basal and medial. Cotyledons moderately short and moderately narrow, $2\frac{1}{8} \times 1\frac{3}{8}$ inches; oval; apex rounded, slightly notched; color moderately dark green. Leaves small, very shallowly lobed, distinctly decurrent; margin distinctly incised at the base, otherwise denticulate, slightly frilled; surface smooth and velvet-like; color very dark green moderately marked with small gray blotches along the veins and intersections with veinlets; petiole medium long, 15-16 inches; spines very many, medium long and very slender. Flower—pistillate, moderately large, $6\frac{1}{2}$ -7 inches across, orange; ovary bowl-like, scalloped about the base; sepals long and moderately heavy, $1\frac{3}{4}$ -2 inches, with moderately large leaf-like appendages;—staminate, medium large, $5\frac{1}{2}$ -6 inches across; sepals very long and heavy, 2 inches, with leaf-like appendages; pedicle very long, 12-14 inches.

Fruit small, 5-6 x 8-10 inches; weight 8-10 pounds. Shape oblate, deeply depressed at base, moderately so at the apex; ribbed narrowly; furrowed very deeply; surface rough, profusely and finely warted. Skin color dull bronze-orange (orange cinnamon) having a very heavy bloom. Fruit stalk medium long and medium heavy, 3-4 inches, curved, slightly ribbed, woody and tough, distinctly expanded at the base. Shell moderately hard and medium thick, $\frac{1}{8}$ inch. Flesh thick to very thick at medial and base, $1\frac{1}{2}$ - $2\frac{1}{2}$ inches, considerably thinner at apex; texture moderately coarse, fibrous, slightly moist; flavor lacking, moderately sweet; quality poor; color variable, yellow to orange blend (buff yellow to light orange yellow). Seed cavity very small, nearest the apex; placental tissue abundant, moist, tough, difficult to remove, considerably deeper orange than the flesh.

Seed small, medium long, narrow and moderately flat, $1.3 \times .60 \times .26$ cm.; very light (500 per oz.); face moderately smooth, somewhat scaly, dull white (cartridge buff); margin rounded, slightly fuzzy (vinaceous buff).

Golden Cushaw. Refs. 14, 24, 33, 41, 44, 50, 59, 73, 89, 90, 115, 129, 130. Syns. Cashaw, Cashew, Cushaw, Cushaw Crookneck, Golden Yellow, Large Yellow Crookneck, Mammoth Golden Crookneck, Mammoth Golden Cushaw, Yellow Cashaw, Yellow Winter Crookneck.

The origin of this variety, which today is the most important of its group, remains unknown. It is one of the few pumpkins or squashes which is unsuited, because of too short a growing season, to northern cultivation. Burr in 1893 in writing of Cashew says: "It is not cultivated or generally known in New England or in the northern portions of the United States; for though well suited to Louisiana and other portions of the South, where it is much esteemed, it is evidently too tender for cultivation where the seasons are comparatively short and cool." Goff in 1884 also found that the Cashew pumpkins would probably mature only in the most favorable seasons.

This group of varieties with fruits which resemble in shape some of the "Calebasses" of Peru or the West Indies is considered as fine table pumpkins in the South. In early catalogs the use of the name Cushaw did not always refer to the same variety. It is a question as to which of the forms was the best known but it appears that the golden fruited strains produced fruits more slender than the white and green striped kinds.

Mature fruits were obtained at Geneva in 125 days, 5 days later than Green Striped and White Cushaw and 10 days later than Japanese Pie. The vines are similar in vigor to those of Green Striped Cushaw but have leaves which are blotched with larger gray areas and have flowers with much longer and broader sepals. The fruits are larger, have a thicker and longer neck and a more abruptly bulbous apex than Green Striped Cushaw. The fruit stalks are distinctly more slender, more curved and tougher than those of Green Striped Cushaw or White Cushaw.

Plant trailing; vines moderately slender, rather dark green, moderately vigorous, 12-15 feet; branches many, basal and medial. Cotyledons moderately short and moderately narrow, $2\frac{3}{8} \times 1\frac{1}{4}$ inches, long oval; apex moderately rounded; color mottled dark grayish green. Leaves moderately small, 10×14 inches, very shallowly 5-lobed; decurrent; margin slightly incised at the base, otherwise denticulate, slightly frilled; color medium green, rather sparsely marked with moderately large gray blotches at the intersections of the veins and veinlets; petiole medium long and moderately heavy, 14-16 inches. Flower—pistillate, large, 7 inches across, orange; ovary crooknecked; apex abruptly enlarged, light green in color; sepals long and broad, $1\frac{3}{4}$ -2 inches, having leaf-like appendages; pedicle short, 5-6 inches;—staminate, smaller, 6 inches.

Fruit moderately large, 18-24 inches long, 8-9 inches in diameter at the apex and 4-5 inches at the medial and base; weight 10-14 pounds. Shape, medial and base a curved cylinder, apex distinctly bulbous; ribbed widely, most prominent at the bulbous apex and extreme base; furrows shallow; surface smooth; blossom scar prominent, blackened, $\frac{3}{4}$ -1 inch in diameter. Skin color deep cream (cinnamon buff) over the entire surface, bloom prominent. Fruit stalk moderately short and medium heavy, $2\frac{1}{2}$ -3 inches, very slightly curved, woody and tough, moderately furrowed, expanded at the base. Shell moderately soft, moderately thin, $\frac{1}{8}$ - $\frac{1}{4}$ inch. Flesh medium thick, $1\frac{1}{4}$ inches at the apex, medial and base solid, texture coarse and granular, very coarse and fibrous; color pale salmon (capucine orange); quality poor. Seed cavity only at apex, moderately small; placental tissue much, moist, very fibrous, cord-like, and tough, difficult to remove.

Seed medium large; medium long, moderately narrow and moderately flat, $1.70 \times .87 \times .24$ cm. (240 per oz.); face slightly scaly, dull buff (tilleul buff); margin distinct, wedge-like, brown (fawn color).

Green Striped Cushaw. Refs. 14, 19, 24, 25, 26, 33, 34, 41, 50, 52, 59, 61, 64, 67, 73, 101, 124, 129, 130, 132, 136. Syns. Brother Jonathan, Green Crookneck Winter, Improved Cushaw, Improved Green Striped Cushaw, Improved Winter Crookneck, Large Winter Crookneck, Maryland Sweet Potato, New Jersey Sweet Potato, Pie Melon, Striped Cushaw, Striped Crookneck.

The Green Striped Cushaw when first introduced was known as the Improved Cushaw. The early records and published descriptions of the "Crane-neck" squash tend to show that the cream-colored or light yellow skin antedated the striped forms. Burr in 1893 describes

the Puritan, which produced a white or creamy white fruit marked and striped with green. This was similar to the markings of Tennessee Sweet Potato. It is quite probable that the striped form of the Cushaw was one of the native varieties of the West Indies but that it became a cultivated form after the development of Golden Cushaw. In present day catalogs this is the one most generally listed.

Mature fruits were produced at Geneva in 120 days, 5 days earlier than Golden Cushaw, in season with White Cushaw and 5 days later than Japanese Pie. The vines are similar in vigor to those of White Cushaw and Golden Cushaw, but the leaves have smaller and more numerous gray blotches and have flowers with much shorter and narrower sepals. The fruits are smaller, have a more slender, shorter and more curved neck, and a larger, more gradually tapering, bulbous apex than Golden Cushaw. The fruit stalks are more like those of maximas, being decidedly heavier, much shorter, straighter and more spongy than those of Golden Cushaw.

Plant trailing; vines very coarse and heavy, moderately dark green, moderately vigorous, 12–15 feet; branches very few, medial. Cotyledons medium long and medium broad, $2\frac{5}{8} \times 1\frac{5}{8}$ inches, long oval; apex tapered; veining very prominent; color mottled dark grayish green. Leaves medium large, 10×15 inches, shallowly 5-lobed; decurrent; margin incised at the base, otherwise denticulate, frilled; surface slightly blistered; color moderately dark green, sparsely marked with small gray blotches at intersections of veins and veinlets; petiole moderately long and heavy, 15–18 inches. Flower — pistillate, large, 7 inches across, with very much curved and crumpled margins, orange; ovary crooknecked with enlarged apex, pale green mottled and streaked with pale yellow; sepals short and very slender, $\frac{1}{2}$ – $\frac{3}{4}$ inch; — staminate, moderately large, $6\frac{1}{2}$ –7 inches across, with margins of petals distinctly curved and crumpled; sepals medium long and medium heavy, 1 inch; pedicle short, 5–6 inches.

Fruit medium large, 16–20 inches long, 8–10 inches in diameter at the apex and 4–5 inches at the base; weight 12–16 pounds. Shape crookneck, decidedly curved at the base, abruptly enlarged at the apex; surface smooth; blossom scar $\frac{1}{2}$ – $\frac{3}{4}$ inch in diameter. Skin color very pale cream (ivory yellow) striped with a coarse, lace-like, dark green (dark dull yellow green) color pattern, extending lengthwise of the fruit in bands about two inches broad. Fruit stalk moderately short and thick, $2 \times 1\frac{1}{4}$ inches, nearly round, rather spongy and soft. Shell moderately soft, thin at the apex, $\frac{1}{16}$ inch, much thicker at the base and medial. Flesh medium thick, 1 inch at the apex, solid at the base; texture coarse and fibrous, tough, moist; pale cream (maize yellow) color; slightly sweet, quality poor. Seed cavity large, at apex; placental tissue abundant, rather moist, fibrous, often chunky, difficult to remove.

Seed medium large; medium long, moderately narrow and medium plump, $1.9 \times 1.05 \times .35$ cm. (128 per oz.); face rough and wrinkled, often pitted, white; margin wedge-like, fuzzy, buff (vinaceous buff) in color.

Japanese Pie. Refs. 14, 27, 31, 33, 41, 45, 61, 63, 64, 73, 129, 130. Syns. Chinese Alphabet, Green Cushaw, Japan Crookneck, Japan Pie, Japanese, Japanese Alphabet, Japanese Crookneck, Japanese Pumpkin, New Japanese, Nippon Island.

With the statement, "This excellent new variety of pumpkin comes from Japan" Samuel Wilson, Mechanicsville, Pennsylvania, introduced in 1884 what he called Japanese Pumpkin. Its use spread rather rapidly for it had several characteristics which were well suited to advertising. One of these, a seed character, strangely

enough had little to do with either the suitability, prolificacy, or quality of the variety. The seeds, "curiously marked or sculptured in the manner of Chinese letters," led to the name Chinese or Japanese Alphabet Squash and because of this the variety was widely grown as a novelty. In 1890 Gregory described it as "closely resembling the old-fashioned Crookneck of the North and the Cashaw of the South; but differs from the former in having a fleshy stem and from the latter in the peculiar marking of its seed and from each in being superior in quality." Its chief use has been for canning and as food for stock.

At Geneva this variety matured in 115 days, 5 days earlier than Green Striped Cushaw, and 5 days later than Tennessee Sweet Potato and Cheese. The vines are slightly less vigorous than those of Green Striped Cushaw, have slightly smaller leaves which are distinctly lighter green and marked with larger gray blotches. The flowers are much smaller, more prominently veined, and the petal margins are more recurved. The fruits are much darker green, less curved, and have a larger, thicker fruit stalk. The surface of the seeds is distinctly more cracked and pitted than those of any other variety.

Plant trailing; vines moderately coarse, very dark green, moderately vigorous, 10–12 feet; branches medium number, basal and medial. Cotyledons medium long and medium broad, spoon-like, apex rounded; veining prominent; color moderately light green. Leaves moderately small, 11×13 inches, broadly 5-lobed; decurrent; sinuses very narrow, acute; margin slightly incised at the base, otherwise denticulate; surface smooth; color moderately light green, profusely and distinctly marked with medium large, light gray blotches at the intersections of veins and veinlets; petiole medium long and slender, 12–15 inches; spines very few, short and slender. Flower — pistillate, moderately small, $4\frac{1}{2}$ –5 inches across, orange; margins of petals recurved, distinctly undulate, veins green, very prominent; ovary long pyriform; sepals very short and moderately heavy, $\frac{1}{4}$ inch; — staminate, moderately small, $4\frac{1}{2}$ –5 inches across, petals same as pistillate; sepals short, moderately broad and slightly flattened, $\frac{5}{8}$ inch; pedicle short, 5–6 inches.

Fruit moderately small, 15–18 inches long, 7–9 inches in diameter at the apex and 4–5 inches at the base and medial; weight 10–14 pounds. Shape, base and medial a moderately curved cylinder, apex abruptly enlarged, bulbous; surface nearly smooth at the bulbous tip, with base and medial rough, heavily corked and corrugated; blossom scar with button, very slightly extended. Skin color consists of alternating very dark (dull blackish green) and moderately dark green (Varley's green) lace-like stripes through the mesh of which appears a light green (deep turtle green); often obscure differentiation. Fruit stalk moderately short and very thick, $2-2\frac{1}{2} \times 1\frac{3}{4}$ –2 inches, nearly round, straight, soft and corky. Shell moderately soft and medium thick, $\frac{1}{8}$ inch. Flesh moderately thin at the apex, $\frac{3}{4}$ –1 inch, solid at the base and medial; texture moderately coarse, slightly fibrous, juicy; slightly sweet, yellow (buff yellow); quality poor. Seed cavity medium small, at apex; placental tissue abundant, moist, tender, rather easily removed.

Seed medium large; medium long and broad, moderately plump, $1.85 \times 1.04 \times .45$ cm. (136 per oz.); face rough, distinctly creased and pitted, (tulle! buff); margin distinctly wedge-like, fuzzy (pinkish buff).

Kentucky Field. Refs. 33, 73, 130. Syns. Indiana Cornfield, Indiana Field, Kentucky Large Field, Kentucky Mammoth, Large Yellow Kentucky Field, Mammoth Kentucky Field, Sweet Cheese.

By many Kentucky Field is considered identical to Cheese. The two varieties are quite similar and it is probable that Kentucky Field was selected from Cheese

and that its individuality, in many instances, has not been maintained. The name itself is popular and in time may become the accepted name for the group.

Maturity was attained at Geneva in 125 days, 15 days later than Cheese and 5 days later than Calhoun. The vines are much like those of Cheese, but have leaves which are marked with larger gray blotches and shorter and heavier petioles. The fruits are slightly larger and much more variable in shape and color pattern. After storage both varieties have much the same color.

Plant trailing; vines slender, medium green, vigorous, 15-18 feet; branches moderately many, basal and medial. Cotyledons medium long and medium broad, $2 \times 1\frac{5}{8}$ inches, long oval; apex rounded; veining moderately prominent; color grayish green. Leaves small, 9×13 inches, shallowly 5-lobed; decurrent; margin slightly incised at the base, otherwise denticulate, very slightly frilled; surface smooth; color moderately dark green, marked with moderately large gray blotches at the intersections of veins and veinlets and occasionally along the veins; petiole medium long, 14-16 inches. Flower—pistillate, very large, 8 inches across, orange; ovary nearly globular, pale green, spotted with creamy white; sepals very short and slender, $\frac{3}{4}$ inch;—staminate large, $7\frac{1}{2}$ inches across, sepals moderately long and broad, $1\frac{1}{2}$ inches, leaf-like; pedicel moderately long, 9-10 inches.

Fruit moderately small, $6-7 \times 12-15$ inches; weight 12-16 pounds. Shape oblate, distinctly flattened, base and apex moderately depressed; ribbed widely; furrows moderately shallow; surface smooth, slightly wrinkled, leathery; blossom scar large, $1-1\frac{1}{4}$ inches in diameter, prominent, blackened and checked blossom remains present. Skin color in the early mature stage consists of a moderately regular lace-like pattern of various shades of green depending upon the age of the fruit, during storage these are replaced by deep cream (cinnamon buff). Fruit stalk medium long, $3-3\frac{1}{2}$ inches, slightly curved, rough, shallowly furrowed, woody and tough, decidedly expanded at the base. Shell soft and medium thick, $\frac{1}{8}$ inch (warm buff). Flesh moderately thin, $\frac{3}{4}-1$ inch; texture very coarse and fibrous, juicy and moderately tough; slightly sweet, dull salmon orange (capucine orange); quality poor. Seed cavity large; placental tissue abundant, moist, tough and very fibrous, cord-like, very difficult to remove.

Seed small; short, broad and moderately flat, $1.37 \times .86 \times .26$ cm. (276 per oz.); face rather rough and slightly wrinkled, buff (tilleul buff); margin wedge-like, fuzzy, brown (fawn color).

Kikuza. Syn. Sweet Kikuza.

Very similar to Chirimen in character of skin and surface of the fruit, this variety of Japanese origin was offered by the Oriental Seed Co. of San Francisco in 1927.

Mature fruits were produced in 140 days, in season with Saikyo, 5 days later than Chirimen and 25 days later than Japanese Pie. The fruits are thicker and broader than those of Chirimen, and much less wrinkled and warted, also more broadly ribbed and more shallowly furrowed.

Plant trailing; vine and foliage characters practically the same as those of Chirimen except that the gray blotches on the foliage are less numerous. Flower—pistillate, large, $7\frac{1}{2}-8$ inches across, orange; corolla very soft and velvet-like; corolla tube heavily pubescent with long hairs; stigma nearly compact, greenish yellow in color; ovary umbraculiform, slightly furrowed; sepals very long and moderately heavy, $2-2\frac{1}{4}$ inches, with large distinct leaf-like appendages;—staminate, moderately large, 6 inches across; sepals medium long and broad, $1\frac{1}{4}-1\frac{1}{2}$ inches, occasionally with small leaf-like appendages; pedicel long, 10-14 inches.

Fruit small, $5-6 \times 9-10$ inches; weight 5-8 pounds. Shape somewhat drumlike, deeply depressed at the base and moderately at the apex; ribbed moderately narrow; furrows moderately deep; surface rough, warted and wrinkled; skin color is dull bronze orange

(orange cinnamon), bloom abundant. Fruit stalk medium long and medium heavy, 3-4 inches, slightly curved, round, smooth, woody and tough, distinctly expanded at the base. Shell moderately hard, medium thick, $\frac{1}{8}$ inch. Flesh variable in thickness, $1-1\frac{1}{2}$ inches at the base; texture fine, moderately dry, tender, crisp; sweet, rather spicy flavor; color deep yellow (deep chrome) somewhat less intense near the shell; quality fair; seed cavity small, in center; placental tissue little, rather moist, tender and easily removed.

Seed moderately small; moderately short, moderately broad and flat, rather long-necked, $1.46 \times .86 \times .20$ cm. (352 per oz.); face moderately smooth, dull white (cartridge buff); margin slightly ridged, pale buff (vinaceous buff), slightly fuzzy.

Neapolitan. Refs. 24, 48, 49, 75, 97, 101, 137. Syns. Carpet-bag Gourd, Long Naples, Long Naples Green Not Ribbed, Long Neapolitan, Naples Giant.

This was described by Burr in 1863 but was not generally cataloged in this country. From time to time it was listed as a novelty; one of the last so noted being that of the Iowa Seed Co. in 1906. The peculiar shape of the fruits is responsible for the use of the name Carpet-bag Gourd. A smaller fruited strain, Early Neapolitan (Early Carpet-bag), was listed by Thorburn in 1906; this was also noted by Robinson who says, "It is much earlier than the giant form."

This variety was similar to White Portmanteau in shape, being somewhat more enlarged at the apex and having a more buff-yellow skin color at full maturity.

Plant trailing; vines moderately slender, moderately vigorous, 10-15 feet; leaves medium large, very shallowly lobed, tapered at the apex; color dull green marked with gray blotches along the veins and veinlets; margin slightly sinuate and undulate.

Fruit medium large, 16-20 inches long, 5-8 inches in diameter at the apex and 4-5 inches at the base and medial. Shape slightly curved, slightly enlarged or swollen at the apex; ribbed broadly; furrowed very shallow, obscurely. Surface moderately smooth. Skin color bright green, at full maturity becoming dull yellow. Flesh moderately thin at the apex, solid at the base and medial; color bright yellow.

Seeds few, located in the apex only, dull white in color.

Puritan. Ref. 24.

Burr in 1863 mentions this variety as "long common to the gardens in the vicinity of the Old Colony." This places its early use in Massachusetts. However, it apparently was not listed in catalogs after the varieties of better quality were known. From the description of the fruits it was a variety quite similar to Tennessee Sweet Potato.

Quaker Pie. Refs. 14, 28, 32, 33, 64, 73, 129, 130.

Quaker Pie is very similar to the Cheese Pumpkins in color and smoothness of the skin but differs in shape. It is quite probable that the variety was a selection from Cheese. W. Atlee Burpee & Co., having secured seed from a family of Quakers in Washington County, New York, introduced this variety in their 1888 seed catalog. This moschata has never been widely used but has found favor in some sections because of its uniformity.

The variety matured in 120 days at Geneva, 10 days later than Cheese and 5 days earlier than Virginia Mammoth. The vines are considerably less vigorous

than those of Virginia Mammoth, have smaller leaves and have flowers which are slightly larger with smaller sepals. The fruits are similar in color but those of Quaker Pie are shorter and more pyriform in shape.

Plant trailing; vines slender, medium green, occasionally very dark green, vigorous, 15–18 feet; branches many, basal and medial. Cotyledons moderately short and narrow, $2\frac{1}{8} \times 1\frac{1}{8}$ inches, oval; apex moderately tapered; color moderately light grayish green. Leaves small, 9 x 12 inches, shallowly 5-lobed; decurrent; margin slightly incised at the base, otherwise denticulate, slightly frilled; surface smooth; color dark green profusely marked with moderately large gray blotches along the veins and at intersections; petiole medium long and moderately slender, 14–16 inches. Flower — pistillate, very large, 8 inches across, orange; ovary fusiform; sepals moderately short and broad, $\frac{3}{4}$ inch, somewhat leaf-like; — staminate, medium large, 5–6 inches across; sepals medium long, $1\frac{1}{4}$ inches, leaf-like, expanded at the tip; pedicel moderately long, 9–10 inches.

Fruit moderately small, 10–12 x 8–9 inches; weight 10–12 pounds. Shape pyriform, often thickened at the neck, slightly depressed at base and apex; ribbed moderately narrow; furrows very shallow; surface smooth; blossom scar inconspicuous. Skin color consists of a dark cream (cinnamon buff) lace-like pattern over the entire surface, through the mesh of which a ground color of paler cream (pale ochraceous buff) is evident. Fruit stalk medium long and thick, 3–4 inches, curved, slightly furrowed, woody and tough, distinctly expanded at the base. Shell moderately soft and moderately thick, $\frac{1}{8}$ – $\frac{3}{16}$ inch. Flesh moderately thick, $1\frac{1}{4}$ inches, slightly thicker at the base; texture coarse, fibrous, particularly the innermost layer, moist, rather tough, insipid, pale orange (capucine orange); quality poor. Seed cavity large; placental tissue abundant, very moist, tough and fibrous, very difficult to remove.

Seed medium large; medium long, moderately narrow and medium plump, 1.8 x .96 x 31 cm. (184 per oz.); face slightly rough, dull yellowish brown (tulle buff); margin wedge-like, crinkled and moderately fuzzy, light brown (fawn).

Saikyo.

This is a variety of Japanese origin listed by the Oriental Seed Co. of San Francisco in 1927. In shape it is quite unlike other squashes the fruits resembling a jug with a large base.

At Geneva this variety matured its fruit in 140 days, in season with Kikuza, 5 days later than Chirimen and 25 days later than Japanese Pie. The flowers are slightly smaller than those of Kikuza and have bell-like ovaries with the stigma more expanded. The fruits are much larger, distinct in shape, and similar in surface character to those of Kikuza.

Plant trailing; vines and foliage very much the same as Chirimen. Flower — pistillate, large, 7 inches across, orange; ovary somewhat bell-like, constricted near the base; sepals long and decidedly leaf-like, $1\frac{1}{2}$ –2 inches; — staminate, moderately small, $4\frac{1}{2}$ –5 inches across; petals slightly recurved and frilled; veins very prominent, dark green; stigma velvet-like, yellowish green, slightly expanded; sepals very long and broad, 2–2 $\frac{1}{4}$ inches, small leaf-like appendages present; pedicel very long, 12–14 inches.

Fruit moderately small; 9–10 inches long, 10–12 inches in diameter near the apex and 8–10 inches near the base; weight 10–12 pounds. Shape bell-like moderately constricted near the base; ribbed moderately narrow; furrows moderately deep; surface rough and wrinkled, warted and often profusely marked with small blister-like eruptions; blossom scar depressed. Skin color develops very late, changes from (dark greenish black) to (zinc orange) to (tawny) to (russet); marked with a very heavy bloom in the later stages. Fruit stalk moderately short and heavy, 2–3 inches, curved, moderately furrowed, woody and tough, distinctly expanded at the base.

Shell moderately hard and thin, $\frac{1}{16}$ inch. Flesh moderately thick, $1\frac{1}{4}$ inch at the base, otherwise about 1 inch; texture moderately coarse, somewhat fibrous, moderately moist; rather sweet; color light yellow (light cadmium); quality fair. Seed cavity moderately small, conforms to fruit shape; placental tissue moderately little, orange color, dry, somewhat fibrous, easily removed.

Seed moderately small; moderately short, medium broad and moderately flat, 1.68 x .96 x .29 cm. (288 per oz.); face moderately smooth, slightly scaly, dull white (cartridge buff); margin moderately rounded, slightly fuzzy, buff (vinaceous buff).

Seminole.

This tropical pumpkin has been grown in Florida for hundreds of years and occasionally has been offered in seed lists. Aggeler & Musser of Los Angeles in 1916 featured it as a most promising sort, with a photograph which showed the fruits as bell shaped. The name comes from the Seminole Indian tribe from whom the original seed was secured.

Tennessee Sweet Potato. Refs. 14, 26, 33, 40, 41, 61, 73, 82, 106, 129, 130. Syns. Genesee Sweet Potato, Green Striped Bell, Sweet Potato, Tennessee, Virginia Sweet Potato.

The catalogs of Thorburn in 1847 and in 1856 offered a variety under the name Green Striped Bell. While a good description of this is not available it would seem that it might have been the original of the variety herein described. It has its counterpart for shape in the Puritan Squash described by Burr in 1863. The first use of the name Tennessee Sweet Potato in available literature is found in the 1883 catalog of W. Atlee Burpee & Co. Some of the characters which have been responsible for its extensive use in the South are its long keeping qualities, its thick dry fine-grained flesh, and its excellent flavor. This is one of the thick, fleshy stemmed moschatas.

Mature fruits were produced at Geneva in 110 days, 5 days earlier than Japanese Pie and in season with Cheese and Calhoun. The vines are considerably more vigorous than those of Japanese Pie, have leaves which are decidedly darker green and much more sparsely blotched with gray. The flowers are larger and somewhat less ruffled, while the fruits are much lighter in color but have very similar fruit stalks.

Plant trailing; vines coarse, vigorous, 15–18 feet; branches moderately many, basal and medial. Cotyledons medium long and moderately broad, $2\frac{7}{8} \times 1\frac{3}{4}$ inches, broad oval; apex tapered; veining prominent; color dark green, somewhat mottled. Leaves medium large, 10 x 15 inches, shallowly 5-lobed; decurrent; margin slightly incised at the base, otherwise denticulate, slightly frilled, surface somewhat blistered; color very dark green, sparsely marked with small, light gray blotches at the intersections of veins and veinlets; petiole medium long and moderately heavy, 14–16 inches; spines very few, short and slender. Flower — pistillate, moderately large, 6–7 inches across, orange; petals with margins somewhat recurved and shallowly frilled; ovary club-like, gradually tapering from the base to a much swollen apex; sepals very short and moderately slender, $\frac{3}{8}$ inch; — staminate, medium large, 5 inches across, petals recurved and shallowly frilled; sepals moderately short, broad and moderately thick, $\frac{3}{4}$ inch; pedicel medium long, 8–9 inches.

Fruit medium large, 12–15 inches long, 9–10 inches in diameter at the apex and $4\frac{1}{2}$ –5 inches at the base; weight 12–15 pounds. Shape pyriform; surface smooth; blossom scar $\frac{3}{4}$ inch in diameter. Skin color pale yellow (ivory yellow), rather uniformly marked with broad longitudinal greenish yellow (dull green yellow) lace-like



TENNESSEE SWEET POTATO

(Two-thirds natural size)



stripes, changing to yellow (mustard yellow) during storage. Fruit stalk short and very thick, $1\frac{1}{2}$ – $2 \times 1\frac{1}{2}$ – $1\frac{3}{4}$ inches, round, straight, soft and corky. Shell medium thick, $\frac{1}{8}$ inch, very hard, pale yellow (margarite yellow). Flesh moderately thin at apex and medial, base $3\frac{1}{2}$ –4 inches, nearly solid; texture coarse, granular, moderately firm, rather moist; moderately sweet, light yellow (maize yellow); quality poor. Seed cavity large, conforms to fruit shape; placental tissue abundant, rather moist, very fibrous, difficult to remove.

Seed moderately large; moderately long, moderately narrow and plump, $2.0 \times 1.04 \times .47$ cm. (124 per oz.); face moderately rough, pitted and creased, glossy white; margin sharp wedge-like, buff (vinaceous buff), moderately fuzzy.

Virginia Mammoth.

This is one of the pumpkins recommended for use in the South. It is apparently an old variety for it is listed in the 1895 catalog of T. W. Wood & Sons of Richmond, Virginia, and has been carried continuously since.

Virginia Mammoth matured at Geneva in 125 days, 15 days earlier than Chirimen, in season with Kentucky Field, and 5 days later than Quaker Pie. The vines are more vigorous than those of Quaker Pie and have larger, more frilled leaves, while the flowers have longer and distinctly broader sepals. The fruits are much larger and longer than those of Quaker Pie but have much the same skin color.

Plant trailing; vines moderately coarse, rather dark green, very vigorous, 18–25 feet; branches many, basal and medial. Cotyledons moderately short and medium broad, $2\frac{3}{8} \times 1\frac{1}{2}$ inches, broad oval; apex rounded, slightly notched, veining prominent; color grayish green. Leaves medium large, 11 x 15 inches, shallowly 5-lobed, decurrent; margin denticulate, distinctly frilled; surface smooth, color moderately dark green, profusely marked with large grayish blotches at the intersections and very often along the veins; petiole medium long and medium heavy, 15–16 inches. Flower—pistillate, large, $7\text{--}7\frac{1}{2}$ inches across, orange; ovary fusiform, pale green, mottled and spotted with pale yellow; sepals long and very broad, $1\frac{3}{4}$ inches, distinctly leaf-like at the apex;—staminate, moderately large, $6\text{--}6\frac{1}{2}$ inches; petals distinctly frilled and crumpled; sepals long and very broad at apex, $1\frac{3}{4}$ inches, leaf-like appendage; pedicel very long, 12–14 inches.

Fruit medium large, $14\text{--}16 \times 10\text{--}12$ inches; weight 24–26 pounds. Shape oblong, slightly and usually irregularly tapering from the medial towards both ends; base and apex slightly depressed; ribbed widely; furrows shallow; surface smooth; blossom scar prominent, $\frac{3}{4}$ –1 inch in diameter, depressed, blackened and checked. Skin color consists of a dark buff (cinnamon buff) lace-like color pattern over the entire fruit, through the mesh of which shows a lighter shade of buff (pale ochraceous buff). Fruit stalk medium long and moderately heavy, 3–4 inches, curved, moderately furrowed, woody and tough, decidedly expanded at the base. Shell moderately soft, variable in thickness, $\frac{1}{8}$ – $\frac{3}{8}$ inch. Flesh thick, $1\frac{3}{4}$ –2 inches, thickest at the base and apex, moderately coarse, inner layers much more fibrous than outer ones, moist, insipid, color variable, some with pale salmon orange (capucine orange), others pale amber; quality poor. Seed cavity large, conforms to fruit shape; placental tissue much, moist, tough, very fibrous, very difficult to remove.

Seed medium large; medium long and broad, moderately flat, $1.9 \times 1.12 \times .25$ cm. (176 per oz.); face moderately rough and scaly, buff (lilleul buff); margin rounded, slightly swollen and fuzzy, brown (fawn).

White Cushaw. Refs. 14, 31, 33, 73, 129, 130. Syns. Improved White Cashaw, Jonathan, Large White Cushaw, Mammoth White Cashaw, New Jonathan, Trombone, White Crookneck, White Winter Crookneck.

Under the name Jonathan this was offered as early as 1891 by Livingston and in 1893 by Johnson & Stokes of Philadelphia. Inasmuch as the fruits have no particular merit over the Green Striped the variety has never been widely used but has remained in trade lists until recent years.

Maturity was obtained at Geneva in 120 days, 5 days earlier than Golden Cushaw and in season with Green Striped Cushaw. The fruits are similar to those of Green Striped Cushaw except in color, and have a shorter, more slender neck.

Plant trailing; vines, foliage and flowers much the same as those of Green Striped Cushaw.

Fruit medium large, 18–20 inches long, 8–9 inches in diameter at the medial and 4–5 inches at the base; weight 12–16 pounds. Shape crookneck with a distinctly swollen apex; surface smooth; blossom scar $\frac{3}{4}$ inch in diameter, often slightly depressed. Skin color nearly white (margarite yellow) over the entire surface. Fruit stalk moderately short and thick, $2\text{--}3 \times 1\text{--}1\frac{1}{4}$ inches, slightly curved, slightly furrowed, woody and rather tough. Shell moderately soft and medium thick, $\frac{1}{8}$ – $\frac{3}{16}$ inch. Flesh moderately thin at medial and apex $\frac{3}{4}$ –1 inch, solid at the base; texture coarse, rather stringy along the inner portion, moist, moderately tender; insipid (cream color); quality poor. Seed cavity at apex; placental tissue abundant, tough, difficult to remove.

Seed medium large; medium long and broad and medium flat, $1.86 \times 1.1 \times .33$ cm. (152 per oz.); face finely wrinkled, glossy white; margin wedge-like, moderately fuzzy, buff (vinaceous buff).

White Portmanteau. Refs. 48, 137. Syn. Portemanteau.

From the description given by Goff in 1884 this appears to have been a variety with fruits similar in shape to Neapolitan but with a white skin. It is also listed in Vilmorin with the added confirmation that the vegetative characters are also similar to that variety.

The fruits are individual in shape and may be likened to the neck-like solid portion of Golden Cushaw, lacking the curve and the abrupt swollen apex of that variety. The literature disagrees as to its species, but herbarium specimens available serve as the basis for including it among the moschata varieties.

Plant trailing; vines moderately slender, very dark green near the base, vigorous; leaves large, nearly entire, dark green, profusely marked with grayish blotches at the junction of veins and veinlets; margin denticulate; petiole slender.

Fruit large; $24\text{--}26 \times 7\text{--}8$ inches. Shape cylindrical, somewhat swollen near the apex; ribs obscure; furrows very shallow, surface very smooth; skin color nearly white.

Winter Crookneck. Refs. 24, 50, 59, 64, 130.

This variety differs from that of Canada Crookneck in being considerably larger; from that of Green Striped Cushaw in being either solid dark green or cream; and from the cushaws as a group in having a considerable number of nearly straight fruits.

Plant trailing; vines vigorous; leaves moderately lobed, dark green blotched with gray; petioles slender and very dark green.

Fruit variable in size, usually 18–20 inches long, 6–8 inches in diameter at the apex and 3–4 inches at the medial and base; shape variable, usually crookneck, often nearly straight, decidedly and abruptly swollen at the apex. Skin color green or cream, often changing during storage to a paler green or reddish cream. Extremely variable in flesh, usually salmon yellow in color.

Yokohama. Refs. 4, 5, 11, 14, 26, 50, 59, 67, 71, 82, 101, 126, 132, 137.

Mr. Thomas Hogg of New York visited Japan in 1862 and found a number of interesting cultivated plants. He sent home to his brother James Hogg a variety of seeds and among them were the seeds of a squash. These were planted, made vigorous growth, and produced fruits quite unlike any other squash yet grown in this country. It was natural that the name Yokohama should be given to this variety. There have been a number of other sorts introduced from Japan,

but none have shown characteristics suitable for use as a vegetable by our people. This variety is practically the same as Chirimen and probably was the progenitor of the present-day variety.

Plant trailing; vines moderately slender, vigorous, very dark green. Leaves moderately small, shallowly lobed, bluntly pointed at the apex, very deep dull green, profusely blotched with gray.

Fruit small; 5-6 x 8-10 inches; shape distinctly oblate, depressed at base and apex; ribbed distinctly and narrowly; furrowed deeply and narrowly; surface profusely covered with small blister-like protuberances. Shell hard and woody; skin color very dark green, later turning to light brown. Flesh thick, fine texture, sweet, flavor good, color lemon yellow. Quality moderately good.

SUPPLEMENTARY LIST OF OBSCURE VARIETIES

The names given below represent varieties which can be considered of minor importance and about which little information is available; varieties which were in existence for a very short period; or varieties the seed of

which is not available today and therefore no plantings could be made to determine their status with reference to recognized standard sorts.

Varieties of Cucurbita maxima

Adam's Favorite. Ref. 125.
Apple Skin Hubbard. Syn.
Sweet Potato. Refs. 14, 24, 56.
Banquet.
Bertram. Ref. 21.
Blight Resistant.
Bolton. Ref. 11.
Chinese. Ref. 130.
Eureka. Syn. New Eureka.
Refs. 17, 27, 47, 115, 130.
Flat Top Pie.
Golden Imperial. Ref. 125.
Gray Mammoth. Ref. 31.
Green Spanish.
Guesman. Ref. 38.
Handford's Cream. Ref. 125.
Iowa Standard.
Ironclad. Refs. 33, 41, 73, 129.
Large Bronze Monthéry. Ref. 101.
Large Green. Ref. 101.
Large Sugar. Ref. 37.
Large White. Ref. 137.
Lee's Mammoth.
Mammoth French. Refs. 14, 130.

Mammoth Leghorn. Ref. 3.
Mammoth Summit. Ref. 130.
Mammoth White.
Mission. Ref. 101.
Nicaise. Ref. 101.
Noxall.
Ohio Giant.
Pincushion. Ref. 89.
Premium Hybrid. Ref. 14.
Red Banana. 1937 intr., Gill Bros., Portland, Ore.
Rocky Mountain. Ref. 130.
Spanish Gourd. Refs. 19, 74, 101.
Sweet Nut. Refs. 26, 119, 130.
Underwood Blight Resistant.
Utah Giant Field. Syn. Utah.
Utah Mammoth Field.
Valencia. Ref. 101.
Vow Vow.
West India Mammoth. Refs. 14, 130.
White Leghorn.
Winter Belle.
Woodbury.
Yakima Marblehead. (Gill Bros.)

Varieties of Cucurbita Pepo

Alsatian. Ref. 101.
Barbadoes Cluster.
Citron Bush. Refs. 49, 50.
Columbian. Refs. 17, 130.
Congo. Ref. 101.
Cook's Favorite. Refs. 16, 26.
Cream Vegetable Marrow. Ref. 130.
Early Lemon.
Early Long Watted.
Early Orange.
Egg-shaped. Ref. 24.
Extra Early Cluster.
Golden Cluster. Refs. 14, 47.
Hard Pumpkin. Ref. 94.
Large Sweet. Ref. 130.
Long Marrow. Ref. 88.
Long Yellow Vegetable Marrow. Ref. 101.
Mammoth Sugar. Ref. 130.
Mandarin Bush. Refs. 49, 50.
Melon. Refs. 11, 124.
Mexican Laguna.
Missouri. Ref. 102.
Nice. Ref. 101.

Orange. Refs. 49, 50.
Orange Custard Marrow. Refs. 32, 101.
Prolific Field. Ref. 130.
Red Field.
Russian Queen.
Small Florida.
Sweet Field. Ref. 130.
Sweetheart.
White Bell. Ref. 19.
White Watted Flat Custard Marrow. Ref. 101.
Winter Nut. Refs. 33, 41, 73.

Varieties of Cucurbita moschata

African. 1937 intr., Kilgore Seed Co., Plant City, Fla.
Bordeaux. Ref. 101.
Crystal Spring.
Egg Plant Squash.
Lundgren. Ref. 13.
Mirepoix. Ref. 101.
Orange Color Giant Melon. Ref. 50.
Violette. Ref. 101.

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CHAPTER IV

MUSKMELONS

The first record of the muskmelon being grown in the New World was made by Columbus in 1494 upon the return from his second voyage. Nothing is known concerning the type of melons grown, but they apparently gave rise to desirable sorts, for their diffusion into other parts of America was quite rapid. Cartier reported their presence in 1535 among the Indians near the present city of Montreal, and they were known to exist in Virginia in 1609. Similar reports indicate that the Indians grew them in the vicinity of Philadelphia prior to 1748. In M'Mahon's catalog of 1806, 13 sorts are listed all of which were direct importations from the Old World and accounts of which are included in European literature. Of these Citron and Nutmeg have apparently served as foundation stock for the large number of green-fleshed melons which have been developed. It is said that the Citron or Green Fleshed melon was brought into France by a monk from Africa in 1777, and that it spread from there to many countries and gave rise to numerous varieties. From one of these the variety Pineapple arose and was listed by Thorburn at least as early as 1824. About ten years later Skillman's Netted was introduced and continued to be a favorite sort for many years.

Orange-fleshed sorts were known to have been cultivated at the time of M'Mahon. Just when the common muskmelon of Mawe and Abercrombie appeared is not known, although Long Yellow, acknowledged to be the same, was definitely known about 1846. Soon after that date these highly colored sorts became more prominent as evidenced by the introduction of Christiana about 1850, Sill's Hybrid in 1870 and Surprise in 1876. An orange-fleshed melon introduced into this country sometime after Perry's visit to Japan in 1853, later designated as White Japan, may have had a decided influence in the development of Surprise and others of its type.

Although there are many instances in the literature which emphasize the existence of extreme variation among muskmelons, growers and seedsmen apparently were not especially interested in the selection and further development of them until after 1880. In the decade 1880 to 1890 no less than 17 new and distinct sorts were cataloged, among them being Acme, Champion Market, Emerald Gem, Hackensack, Irondequoit, Miller's Cream, Netted Gem and Osage. The next decade saw the greatest varietal development of any 10-year period in the history of American muskmelons when nearly 30 distinct sorts were introduced. At this time Bender, Cosmopolitan, Gold Coin, Grand Rapids, Kinsman Queen, Long Island Beauty, Paul Rose, Tip Top, and a host of others were listed as new sorts. Interest receded slightly at the beginning of the 20th century, the production of the first 20 years merely equalling that of the preceding 10. This period saw the development of Defender, Ford-

hook, Knight, Pollock No. 25, Hearts of Gold, Melodew and Pollock No. 10-25. The last 15 years have shown a marked increase in the development of new varieties during which period there have been 27 new introductions. Most notable among these are Delicious, Edward's Perfecto, Golden Champlain, Hale's Best, Honey Rock, Peerless Pearl, Imperial Sunset and Weaver Special.

Before the introduction of Netted Gem and the consequent development of the Rocky Ford melons, the area devoted to the culture of muskmelons extended from the northeastern states south to Georgia and the Carolinas and as far west as Missouri. As compared to the present when some 35 states make commercial shipments, one is impressed with the revolutionary changes which occurred and which can be very largely traced to the development of Netted Gem, coupled with better shipping facilities. Obviously growers in the melon shipping districts conducted variety trials to determine the value of other sorts, and in so doing undoubtedly brought about some hybridization. As a result, the development of such varieties and strains as Eden Gem, Pollock No. 25, Pollock 10-25, Edwards Perfecto, Superfecto, Hale's Best, etc., present a rather involved situation, the details of which can be read in the discussion of the above mentioned varieties.

DISCUSSION OF CLASSIFICATIONS

Although several early writers included lists of melon varieties few of them made any attempt to classify the existing sorts. The 9 varieties listed by Mawe and Abercrombie in 1778 were the most comprehensive list available at that time. Apparently each of the three botanical varieties was represented, yet no distinction was made between them.

In 1831 Lindley¹, an English writer, made a comprehensive study of the melons and published his classification. The group was first divided into two divisions, based on the season at which the melons were used, *viz.*: summer melons and winter melons. Each of these in turn were further divided according to the color of the flesh (red, green, or green and white) and thickness of the rind (thick, moderately thick or thin). Apparently all were known simply as melons, for there is no evidence of a separation based on present day recognized botanical varieties.

Vilmorin-Andrieux in their first edition of *Les Plantes Potageres* (1856), included a very comprehensive discussion of varieties. In succeeding editions additional information was included and in 1883, the melons were divided into two major groups, netted melons and cantaloupe or Rock melons. The former was further divided into varieties of major importance on the continent, other varieties of netted melons, and English and American varieties. The last group was again

¹ Lindley, George, *Guide to Orchard and Kitchen Garden*. London, England. 1831.

classified according to flesh color as being either red, green or white. No secondary division was made of the cantaloupe or Rock melons.

The first comprehensive book on American gardening was written by Bernard McMahon and was published in 1806, thirty years after the signing of the Declaration of Independence. In it was included a group of 13 melon varieties, which up to that time was the most complete assortment in America.

In 1863 Fearing Burr, Jr., published his "Field and Garden Vegetables of America," a treatise devoted almost entirely to the discussion of vegetable varieties. In writing of melon varieties Burr states "These are exceedingly numerous, in consequence of the great facility with which the various kinds intermix or hybridize. Varieties are, however, much more easily produced than retained; consequently old names are almost annually discarded from the catalogs of seedsmen and gardeners, and new names with superior recommendations, offered in their stead." He divided the varieties into two groups, the common and the Persian melons. No further differentiation is made of the 31 varieties and synonyms discussed.

As with squash and pumpkins, the state agricultural experiment stations from the time of their origin until the first few years of the present century conducted numerous variety trials of muskmelons. A very comprehensive study of varieties was undertaken by F. W. Rane at the New Hampshire Agricultural Experiment Station in 1895, which culminated in the publication of a classification of American muskmelons in 1901. The thesis of this study was based on the assumption that all American varieties of muskmelons could be readily grouped according to size and shape into the following eight classes or "types" as Rane called them, *viz.*, Jenny Lind, Rocky Ford, Hackensack, Montreal, Cosmopolitan, Acme-Osage, Long Yellow and Bay View. As the classification developed each type was further differentiated according to the depth of rib, degree of netting and color of flesh. Until the last ten years the work of Rane has been acknowledged the standard of comparison, but the recent development of modern varieties, particularly the shipping types, has very largely restricted Rane's classification to varieties of historical interest. Although considerable work was accomplished by earlier investigators at Geneva, this crop was one of the few for which no classification was proposed.

W. R. Beattie advanced a simple classification in 1926 very largely based on adaptation for use. Two classes were suggested, netted melons and winter or special melons. The former was further divided into shipping varieties and those adapted for home and market garden purposes, each of which was again divided into variety groups or types, *viz.*, Defender, Netted Gem, Tip-Top, Hackensack, Millers Cream, Jenny Lind, Fordhook, Emerald Gem, Sweet Air and Montreal Market. No further division was suggested for the winter melons.

In 1932 J. T. Rosa, long interested in melon varieties, developed a more comprehensive classification than the

latter and one more adaptable to modern varieties. This was based entirely on the establishment of a group type. All varieties which could be included were further divided according to color of flesh and occasionally to slight shape deviation. Ten group types were established, *viz.*, Netted Gem, Pollock or Rocky Ford, Hoo Doo, Burrell Gem, Hackensack, Osage, Nutmeg, Jenny Lind, Tip Top and Montreal Market. The winter melons were divided into three classifications, Persian, which included the Armenian or Turkish, Honey Dew and Casaba.

No attempt has been made in this study to develop a classification of any sort. With the exception of an occasional minor difference of opinion regarding the establishment of a variety type as a distinct group, muskmelon classifications are, for the most part, satisfactory. At the present time very little change in the general type of varieties is in evidence. There is, however, a decided increase in the development of new strains, but since these can usually be differentiated only on the basis of such characters as yield, uniformity, disease resistance, adaptability, etc., there is little value in additional classification based on purely morphological characters, which after all, are the true bases of varietal separation. The order of discussion of varieties in this publication is, therefore, alphabetical and includes a few botanical varieties other than *Cucumis melo* var. *reticulatus*, in order to acknowledge all types of commercial importance in this country.

Acme. Refs. 4, 23, 25, 28, 29, 38, 39, 45, 46, 48, 49, 53, 58, 83, 84, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 103, 104, 105, 106, 107, 108, 109, 125, 127, 128, 133, 136, 142, 144. Syns. Acme Citron, Baltimore, Baltimore Acme, Baltimore Citron, Baltimore Market, Baltimore Musk, Baltimore Nutmeg, Baltimore Rough, Early Baltimore, Knights Early Maryland, Large Acme, Large Baltimore, Melting Sugar.

The precise origin of this melon is unknown. Prior to the introduction of Acme in the catalogs of D. Landreth & Sons for 1884, Peter Henderson & Co. for 1886 and D. M. Ferry & Co. 1888, the variety Nutmeg was the leading green-fleshed sort. This nutmeg melon, although smaller in many respects, resembled the new introduction. Acme quickly gained popularity and, in its season, could always be found in the best hotels of Philadelphia, New York and Baltimore. The variety has remained in cultivation and has continued to be used in the south.

This midseason variety matured at Geneva a few days earlier than Rocky Ford, in season with Hackensack, and 4-6 days later than Anne Arundel and Knight. The fruits are very similar to those of Anne Arundel in shape, although more often oval than that variety. The netting is less regular and more streaked, while the flesh is more yellowish green.

Plant vigorous; vines moderately slender, branches many.

Fruit medium large, 7-7½ x 5-5½ inches; weight 3-3½ pounds. Shape oval to fusiform, distinctly protuberant at the base; full and rounded at the apex; blossom scar moderately con-

spicuous; ribs moderately prominent, $1\frac{3}{4}$ inches broad at the medial; furrows medium broad, moderately shallow and smooth. Netting moderately abundant, rather coarsely interlaced, often streaked; cork heavy, distributed uniformly over the ribs; interstices moderately deep; skin color creamy yellow sparsely mottled with green.

Flesh pale green near the rind, blending gradually to pale yellowish white adjacent to the cavity, moderately thin, $1-1\frac{1}{4}$ inches; texture moderately soft and juicy, fibrous. Very sweet, rather highly flavored, aroma mild; quality moderately good. Cavity moderately large, $5 \times 2\frac{1}{2}$ inches, circular in cross-section. Rind thick, $\frac{1}{4}$ inch, moderately tough.

Admiral Togo. Refs. 15, 58, 109, 136. Syns. Gold Nugget, Iowa Standard.

D. M. Ferry & Co., Detroit, Michigan, offered this in 1907 as a small oval melon combining the quality of Defender with the netting and shipping qualities of the Netted Gem. Listed by Ferry continuously through 1926 it gained many friends as a medium early sweet melon. Joseph Harris & Co. continued to list the variety through 1931.

It was a moderately early variety, maturing about 4-6 days earlier than Burrell's Gem, in season with Netted Gem and 4-6 days later than Golden Champlain. It most resembled Netted Gem in shape, size and netting characteristics but had flesh much like that of Burrell's Gem.

Fruit small, $4\frac{1}{2}-5 \times 4-4\frac{1}{2}$ inches; weight $1\frac{1}{4}-1\frac{1}{2}$ pounds. Shape short oval, symmetrical, blossom scar obscure; ribs slightly prominent, $1\frac{1}{4}$ inches broad at the medial; furrows broad, shallow and usually smooth. Netting abundant, medium coarsely interlaced; cork medium heavy, rather broadened and uniformly distributed over the ribs. Skin color dark green. Flesh orange, moderately thin, $1-1\frac{1}{8}$ inches; texture medium fine, rather fibrous, firm and juicy; sweet, highly flavored and mildly aromatic; quality good. Cavity very small, $2 \times 1\frac{1}{2}-1\frac{3}{4}$ inches, circular in cross-section. Rind medium thick, $\frac{1}{8}$ inch, tough and strong.

Allen's Superb. Refs. 44, 45.

This variety with oval, thickly netted fruit was listed and described in the 1875 catalog of D. M. Ferry & Co. It was also carried by Hovey in 1863 and Thorburn in 1861. The flesh was green and sweet and in general the variety was classed in the nutmeg group.

Anne Arundel. Refs. 4, 40, 53, 83, 84, 97, 98, 99, 100, 101, 105, 107, 112, 133.

As introduced this variety was an improvement on the Acme or Baltimore Market. Griffith & Turner of Baltimore and Geo. Tait & Sons, Norfolk, Virginia, were the first to offer seed although it had been grown previous to 1890 by a number of the leading growers of Anne Arundel County, Maryland. A clear cut photograph of this melon was shown in the 1898 catalog of Johnson & Stokes. D. Landreth & Sons, Philadelphia, also listed the variety in 1892. For many years it was a popular variety in the tri-state region.

This is a moderately early variety which matured at Geneva 5-6 days earlier than Hackensack, in season with Knight and about a week later than Jenny Lind. The fruits are much like Acme in shape, although slightly larger and more distinctly fusiform. The netting is much more uniformly interlaced and shows less tendency to form long streaks. The flesh of Anne Arundel

is brighter green and does not have the yellowish portion present in Acme.

Plant vigorous; vines moderately heavy and coarse; branches many.

Fruit medium large, $7\frac{1}{2}-8 \times 5-5\frac{1}{2}$ inches; weight 3-4 pounds. Shape fusiform; apex raised; base extended; ribs moderately prominent, $1\frac{3}{4}$ inches broad at the medial; furrows distinct, medium broad, moderately shallow and smooth. Netting moderately abundant, medium finely laced; cork heavy, distributed uniformly over the ribs, the base and apex; interstices moderately deep. Skin color creamy yellow, sparsely mottled with green. Flesh light green, medium thick, $1\frac{1}{4}-1\frac{1}{2}$ inches; texture medium soft, moderately juicy, slightly coarse and fibrous; sweet, somewhat sprightly, rather mildly flavored and mild aroma; quality fair to moderately good. Cavity moderately large, $4 \times 2\frac{1}{2}$ inches, circular in cross-section. Rind thick, $\frac{1}{4}$ inch, strong and moderately tough.

Atlantic City. Syns. Atlantic City Extra Early, Early Atlantic City.

This was a variety which, when introduced in 1889 by D. Landreth & Sons of Philadelphia, was advocated as an improvement over Baltimore Citron. A green-fleshed sort it apparently differed little from that variety except in size. It was cataloged as Atlantic City Extra Early up to 1918.

Banana. Refs. 4, 15, 21, 26, 29, 39, 45, 49, 53, 54, 84, 88, 95, 96, 98, 99, 100, 101, 105, 106, 124, 127, 132, 133, 136, 144. Syns. Banana Citron, Cuban Banana, Mexican Banana.

This melon has been offered as a novelty practically since the time seed catalogs became the popular medium for the listing of seeds and plants. In the catalog of James J. H. Gregory of 1885 he wrote: "None of the 170 varieties of vegetables exhibited by me at the exhibition of the Essex Agricultural Society in the fall of 1883 created a greater interest than the Banana melon. When ripe it reminds one of a large overgrown banana and what is a singular coincidence, it smells like one, having a remarkably powerful and delicious fragrance."

It was one of the latest sorts to mature at Geneva, being in season with Giant and about 4-6 days later than Montreal Market. It is a rather unique variety and although occasionally somewhat netted, it seems to be intermediate in certain respects between the common muskmelon and *Cucumis melo* var. *flexuosus*.

Plant vigorous; vines medium slender; branches many.

Fruit very large, $15-18 \times 4-4\frac{1}{2}$ inches; weight $3\frac{1}{2}-4$ pounds. Shape very long cylindrical, often moderately curved near the base, somewhat tapering at base and apex; blossom scar obscure; ribs prominent, very numerous, $\frac{1}{2}-\frac{3}{4}$ inch broad at the medial; furrows very numerous, narrow, moderately shallow and smooth. Netting very sparse, usually long and streaked, or very coarsely interlaced, very often entirely lacking; cork medium heavy and broad, distributed unevenly; interstices shallow. Skin color creamy yellow. Flesh salmon orange to orange, moderately thin, $1-1\frac{1}{4}$ inches; texture fine, fiberless, soft and juicy; very sweet, often nauseous, very mildly flavored and mildly aromatic; quality fair to moderately good. Cavity very large, $10-12 \times 1\frac{1}{4}-1\frac{1}{2}$ inches, circular in cross-section. Rind thick, $\frac{1}{4}$ inch, soft and rather weak.

Banquet. Refs. 4, 9, 29, 38, 53, 83, 84, 92, 96, 97, 98, 99, 100, 101, 106, 107, 125, 127, 128, 133, 136, 144. Syn. New Banquet.

This melon was introduced in 1891 by Peter Henderson & Co., W. Atlee Burpee & Co., and others as a very



BAY VIEW

(Two-thirds natural size)



promising red-fleshed sort. It originated with Chauncy P. Coy of Nebraska and probably resulted as a selection from the same line that produced the Delmonico. It was a medium sized melon, nearly globular in shape, profusely netted and possessed a deep reddish orange flesh. The name served to ensure the variety wide-spread trial but after 1900 it was seldom offered.

Barling's Montana.

This is a variety which originated in Montana and has been listed since 1922 by the State Nursery and Seed Co. of Helena. It is an early variety reaching maturity at Geneva 6-8 days earlier than Acme, in season with Jenny Lind and 6-8 days later than Extra Early Citron. The fruits most resemble Acme, although they are smaller, somewhat less tapered at the base and have more finely interlaced netting.

Fruit moderately small, $6\frac{1}{2} \times 4\frac{1}{2}$ -5 inches; weight 2-2½ pounds. Shape oval, base occasionally somewhat protuberant, apex even, blossom scar obscure; ribs slightly prominent, $1\frac{1}{2}$ inches broad at the medial; furrows moderately shallow and smooth. Netting moderately abundant, rather finely interlaced; cork heavy, uniformly distributed over the ribs, base and apex. Skin color dull orange sparsely mottled with green. Flesh light green blending to nearly white at cavity, thin, $\frac{7}{8}$ -1 inch; texture medium coarse, fibrous, rather firm and juicy; sweet, highly flavored, very spicy and mildly aromatic; quality fair to good. Cavity medium large, 4 x 2 inches, circular in cross-section. Rind medium thick, $\frac{1}{4}$ inch, medium and strong.

Bay View. Refs. 23, 25, 26, 28, 39, 45, 46, 49, 53, 69, 88, 90, 93, 95, 96, 97, 98, 99, 100, 101, 105, 106, 107, 108, 112, 124, 133, 136, 139, 140, 142, 144. Syns. Bayview Hybrid, Giant of Colorado, Home Sweet Home, Sweet Home.

Bay View is an old variety which was long celebrated as the largest and longest green-fleshed melon in existence. Introduced by W. Atlee Burpee & Co. in 1877, it had a long career, having been offered by that concern continuously until 1922. It was reputedly the hybrid of Casaba and a large California muskmelon, but its characteristics would not lead one to suspect such parentage. Johnson & Stokes in 1899 and the Gurney Seed & Nursery Co., of Yankton, South Dakota, in 1912 listed Giant of Colorado which seemed to very closely resemble the older Bay View.

It is a late variety at Geneva, maturing about a week later than Bender's Surprise, 10 days later than Long Yellow and in season with Banana and Giant. In shape it most resembles Long Yellow, but differs in flesh color and is more completely netted than that variety.

Plant vigorous; vines coarse and heavy; branches many.

Fruit very large, 10-12 x $5\frac{1}{2}$ -6 inches; weight 7-8 pounds, often 10-12 pounds when grown under ideal conditions. Shape oblong, apex rounded; base somewhat tapering and extended; ribs prominent, $1\frac{3}{4}$ -2 inches broad at the medial; furrows broad, deep and smooth, extending from base to apex. Netting medium in amount, rather coarsely interlaced, often streaked; cork coarse and heavy, distributed moderately uniform over the ribs; interstices moderately deep. Skin color tawny to yellowish brown. Flesh light green, often with a yellowish tint at full maturity, medium thick, $1\frac{1}{4}$ -1½ inches; texture rather coarse, moderately firm, somewhat juicy, rather fibrous; slightly sweet, poorly flavored, mild aroma; quality moderately poor. Cavity very large, 7-8 x $2\frac{1}{4}$ -2½

inches, circular in cross-section. Rind thick, $\frac{1}{4}$ inch, rather weak and tender.

Bender. Refs. 15, 36, 54, 58, 64, 65, 75, 78, 79, 82, 105, 109, 121, 129, 143. Syns. Bender's Surprise, Big Bender, Dee-light, Harute, Juicy Fruit.

The Bender melon has come to be the leading variety in New York State grown for local market, roadside sale and, with the advent of shipment by truck, for short haul shipment. Charles Bender, who, on a farm within sight of the Helderberg Mountain ridge, in the Albany, New York, section, began growing melons in 1884 and in 1900 developed the variety now known as the Bender. This variety, which in many ways is similar to Surprise, Irondequoit and Tip Top, represents a long period of selection with these varieties as a basis. The seed strains which are available today, some sold by seedsmen and others by private growers who have made a specialty of melons, produce lines which vary somewhat according to the individual conception of the variety type. The number of variety names and strains for this large-fruited type delayed the distribution of this particular name but the Joseph Harris Seed Co. offered it in 1917 as a superior strain of Surprise.

The variety is included among the midseason sorts at Geneva, maturing about a week later than Delicious, in season with Irondequoit and 10 or 12 days earlier than Montreal Market. It most resembles Irondequoit in form, although it is larger than that variety, more coarsely interlaced, has a much more prominent blossom scar and is known to be a better keeper. Its similarity to that variety has led many to believe the two are synonymous. Well bred stocks of the two, however, are distinct.

Plant very vigorous; vines very coarse and heavy; branches moderately many.

Fruit very large, 8-9 x $7\frac{1}{2}$ -8½ inches; weight 6-8 pounds, occasionally more. Shape very short oval, slightly enlarged at the base; apex rounded, blossom scar large and very prominent; base rounded and occasionally somewhat flattened; ribs prominent, $2\frac{1}{2}$ inches broad at the medial; furrows broad, medium depth, smooth and extend from base to apex; netting medium in amount, coarsely interlaced; cork broad and heavy, distributed unevenly over the ribs; interstices moderately deep; skin color grayish green, turning creamy yellow (cream color) at maturity. Flesh orange; thick, $1\frac{3}{4}$ -2 inches, uniform; texture rather soft, very juicy, slightly coarse and fibrous; very sweet, rather highly flavored, aroma mild and pleasant; general quality very good. Cavity very large, 5 x 4 inches; circular in cross-section. Rind very thick, $\frac{3}{8}$ inch, and moderately strong.

Bird. Refs. 4, 28, 46, 53, 91, 96, 98, 99, 100, 106, 111, 127, 133, 144.

The Bird cantaloupe was one of the first melons to be developed in this country, its history having been recorded in the *Rural New Yorker* for 1885. The originator, F. E. Bird of Denver, Colorado, claimed for his new melon extreme earliness, large size, fine flavor and good keeping qualities. Seed which had been saved from Green Montreal muskmelons grown in the garden adjacent to a row of Bay View was planted and one vine produced melons so different and outstanding that seed was again saved. After several years testing seed was supplied to Gregory, Burpee and other seedsmen

and until about 1901 the variety was well known. The fruits were large often weighing up to 20 pounds, "oblong, heavily netted, with green flesh, rather coarse in quality but quite sweet."

Bottomly. Refs. 58, 109. Syn. Schramm.

This melon, which belongs in the Netted Gem group, was a selection from Anne Arundel. First offered in 1918 by George Tait & Sons of Norfolk, Virginia, it has seemed well suited to growing conditions as found in the tri-state area and Virginia. Thos. F. Bottomly of Maryland made the original selection and the variety bears his name. An earlier selection from the Bottomly was made by the Schramm Brothers of Maryland and this became known as the Schramm Melon.

It is a moderately early variety, having reached maturity at Geneva several days earlier than Acme, in season with Anne Arundel, and about a week later than Early Prolific Nutmeg. The fruits are similar in shape to Anne Arundel, being less fusiform and more oval. The netting is more profuse and more finely interlaced while the flesh is darker green in color.

Plant moderately vigorous; vines medium coarse and heavy.

Fruit moderately small, $5\frac{1}{2}$ -6 x 4-4 $\frac{1}{2}$ inches; weight 1 $\frac{1}{2}$ -2 pounds. Shape oval, apex even and rounded; blossom scar moderately conspicuous; base full and rounded, occasionally somewhat tapered; ribs obscure, about 1 $\frac{1}{4}$ inches broad at the medial, not very uniform; furrows narrow, shallow, smooth, and extend from base to apex. Netting abundant, finely interlaced, particularly at the apex; cork heavy, distributed uniformly over the ribs, base and apex; interstices moderately deep with skin rather profusely covered with hair-like fuzz; skin color green, slightly mottled with dull orange yellow. Flesh green, medium thick, 1 $\frac{1}{4}$ inches; texture medium firm, rather juicy, slightly coarse and fibrous; sweet, rather sprightly, highly flavored, pleasant aroma; quality good. Cavity small, 2 $\frac{1}{2}$ x 2 inches, somewhat triangular in cross-section. Rind medium thick, $\frac{1}{8}$ inch, strong and tough.

Burrell's Gem. Refs. 15, 54, 58, 64, 74, 75, 101, 105, 109, 110, 129, 133, 136, 143. Syns. Benton Harbor Gem, Berry's Favorite, Burrell's Netted Gem, Defender, Earliest Gem, Early Wonder, Farthest North, Ferry's New Defender, Gem, Golden Treasure, Improved Burrell's Gem, Jumbo Pink, Jumbo Pink Meat, Mill's Famous, Ordway Cantaloupe, Ordway Gem, Ordway Pink, Ordway Pink Meat, Ordway Queen, Pink Flesh, Pink Meat, Red Rocky Ford, Salmon Fleshed.

Defender was introduced by D. M. Ferry & Co. of Detroit in 1901 and probably came as a selection from the variety Paul Rose. Soon after its introduction a selection from it was introduced by D. V. Burrell, Rocky Ford, Colorado, and called Burrell's Gem. In the 1907 Burrell catalog this is stated to possess "a combination of the characteristics of the following varieties: Osage, Defender, Rocky Ford, and Acme, and more particularly the Defender and Acme." Since that time the names "Defender" and "Burrell's Gem" have been practically synonymous and while the latter is more frequently used, a qualifying statement is often made; "known also as 'Defender' or 'Ordway Pink Meat.'" (The last represents merely a thicker-meated strain named for the town, Ordway, Colorado.)

As a midseason shipping melon this variety has few equals. It produced edible fruits 4 or 5 days earlier than Pollock 10-25, in season with Hearts of Gold, and a few days later than Bender's Surprise and Hale's Best. The netting is much more streaked and the fruits more fusiform than Hale's Best and are furrowed similarly to Hearts of Gold. The netting is much like that of Hale's Best, although often is not as finely interlaced.

Plant vigorous; vines moderately coarse and heavy.

Fruit moderately small, $6\frac{1}{2}$ -7 x 4 $\frac{1}{4}$ -4 $\frac{1}{2}$ inches; weight 2 $\frac{1}{4}$ -3 pounds. Shape long oval, apex and base somewhat rounded to slightly tapered; blossom scar obscure; ribs rather prominent, 1 $\frac{1}{2}$ inches broad at the medial; furrows moderately narrow, shallow, smooth and conspicuous. Netting abundant, moderately fine laced; cork medium heavy, distributed uniformly over the ribs, base and apex; interstices medium deep. Skin color dark green becoming rather yellowish green at full maturity. Flesh salmon-orange, moderately thick, 1 $\frac{1}{2}$ -1 $\frac{3}{4}$ inches; texture fine, moderately firm, moderately juicy, somewhat pulpy; sweet, rather sprightly, highly flavored, pleasant aroma; quality very good. Cavity moderately small, 4 x 1 $\frac{1}{2}$ inches, triangular in cross-section. Rind medium thick, $\frac{1}{8}$ inch, strong and tough.

Bush. Refs. 74, 109. Syns. Henderson Bush, Vineless, Vineless Jenny Lind.

This is the first muskmelon to be introduced, of all the hundreds of special introductions, as a vineless or bush variety. After several years of breeding and selecting, Peter Henderson & Co. in 1912 offered it as Henderson Bush. "Valuable and remarkable as a seed novelty, a climax in plant breeding and vine curtailment," its merit was especially extolled because of the increased number of hills which might be planted on a given acre. The bush character was obtained by a shortening of the stem between the nodes. The fruits were green-fleshed very similar to the popular Jenny Lind.

California Beauty. Refs. 133, 146. Syn. California Large Nutmeg.

This was introduced by Johnson & Musser Seed Co., Los Angeles, in 1898 as an extra early green-fleshed melon similar to Hackensack. Judging from illustrations which appeared in early catalogs the fruits seem to have been slightly smaller and to have more closely meshed netting. The variety was popular on the San Francisco market and is in limited use in some sections today.

Captain. Refs. 26, 53, 98, 99, 100.

This melon, a green-fleshed sort, attracted attention because of its earliness. It was somewhat like Hackensack but smaller, and was pictured in the 1897 catalog of Johnson & Stokes, Philadelphia. Popular for some time on the markets of that city nevertheless it was offered only for a few years.

Casaba. Refs. 10, 14, 15, 22, 28, 29, 32, 39, 41, 45, 46, 49, 58, 88, 90, 91, 92, 93, 95, 96, 98, 99, 100, 105, 108, 109, 110, 120, 124, 127, 129, 133, 134, 136, 142, 144, 146.

The Casaba, native to Asia Minor, belongs to the winter melon group. The name itself is derived from the town Kassabah near Smyrna. Inasmuch as it is very late in maturing and requires a long growing season, it has

not been found suitable except in parts of California and the Southwest.

Casaba was known to eastern growers about 1850 when the Patent Office distributed seed under this name. This melon was from Persia but records show that in type it was similar to Bay View. It was also known as Odessa or Persian. A similar sort was popularized by General Bidwell of Chico, California, as the Bidwell Casaba. The Green Persian, which seems to have been very similar if not identical with the latter, was offered by Ross of Boston in 1827.

According to L. H. Bailey (14), seed of Casaba melons was sent from Smyrna to California in 1878 by Dr. J. D. B. Stillman and James L. Flood who found the melons in the hotels of that city. Mr. G. P. Rixford, then connected with the Evening Bulletin, was instrumental in distributing seed to rural subscribers. However, this type of melon did not become popular until some forty years later.

The commercial Casaba melon industry began about 1909 when the San Joaquin Valley Melon Growers Association shipped several carloads of Golden Beauty Casaba to Portland, Oregon. Since then the business has grown and this type of melon is now well known in all markets of the country. Aggeler & Musser of Los Angeles have done much to promote the popularity of these melons and in 1909 listed nine varieties. They have also introduced some hybrids between the Casaba and cantaloupe melon.

Several varieties of this type are grown in the Southwest at the present time, chief of which is Golden Beauty. The fruits are large, oblate oval or short pyriform in shape, lemon-yellow in skin color, tough skinned, not netted or ribbed, but profusely marked with longitudinal corrugations or deep wrinkles. The flesh is very thick, nearly white in color, juicy, without aroma, sweet and of good quality when properly ripened.

Santa Claus is of secondary importance, much longer than thick, nearly cylindrical, somewhat tapered at the ends, smooth skinned and colored with blotches of black and yellow. The interior is much like Golden Beauty.

Winter Pineapple and Golden Hybrid are minor sorts belonging to this group. The former was supposedly the first of the Casabas to be introduced to America. It is practically identical with Golden Beauty except in color, that of Winter Pineapple being light green when fully mature.

Champion Market. Refs. 22, 23, 29, 35, 38, 39, 47, 53, 69, 88, 91, 95, 96, 97, 98, 99, 100, 101, 105, 106, 107, 127, 133, 136, 140, 144. Syns. Bridgton Favorite, Starn's Favorite.

This melon was introduced in 1887 by W. Atlee Burpee & Co., James J. H. Gregory, A. W. Livingston Sons, Vaughan Seed Co., and possibly others. The same year Wm. Henry Maule introduced the melon under the name Starn's Favorite. E. N. Starn of Fairton, New Jersey, a well known melon grower, had worked with the seed stock for about ten years before it was purchased by the seed trade. For many years it was widely grown for

the New York trade, and was justly popular because of its size and quality.

Champion Market is a late variety which matured at Geneva a few days earlier than Montreal Market, in season with Chicago Market and about a week or 10 days later than Bender's Surprise. The fruits are similar to those of Montreal Market, being less symmetrical, smaller and less uniformly netted. The fruits are also more globular than those of Chicago Market, somewhat less deeply furrowed, and more yellowish green in flesh color.

Plant vigorous, vines medium heavy and coarse; branches many.

Fruit medium large, $6-6\frac{1}{2} \times 5\frac{1}{2}-6$ inches; weight $4-4\frac{1}{2}$ pounds. Shape nearly globular, often somewhat lop-sided; base full to somewhat flattened; apex even and slightly flattened, blossom scar conspicuous; ribs prominent, $1\frac{1}{2}-2$ inches broad at the medial, not very uniform; furrows medium broad and deep, smooth. Netting moderately abundant, rather coarsely interlaced; cork moderately heavy, distributed uniformly over the ribs, base and apex; interstices moderately deep. Skin color green, sparsely mottled with pale yellow. Flesh light green to greenish yellow near the cavity, moderately thin, $1-1\frac{1}{4}$ inches, thinner at the apex; texture coarse and fibrous, moderately firm and juicy; sweet, somewhat sprightly, rather highly flavored, mild aroma; quality fair. Cavity large, $4 \times 3\frac{1}{4}$ inches, circular in cross-section. Rind thick, $\frac{1}{4}$ inch, thinner at the apex, rather soft, medium tough.

Chicago Market. Refs. 4, 23, 29, 40, 44, 46, 49, 53, 91, 96, 97, 98, 99, 100, 101, 105, 109, 125, 127, 133, 144. Syns. Chicago, Chicago Market Nutmeg, Chicago Nutmeg, Giant Chicago, Giant Chicago Market, Improved Large Green Nutmeg.

This melon, a probable selection from Montreal Market, was developed by A. Calvin, a gardener near Chicago. The exact date of its introduction is not known, but since it was offered by Gregory in 1882 it was possibly listed by Vaughan and other Chicago seedsmen about that time. The variety never became popular as a shipping melon as the fruits were somewhat flattened at the ends, but was a desirable sort for the home garden.

This is a late variety maturing at Geneva a few days earlier than Montreal Market, in season with Champion Market and about a week or 10 days later than Bender's Surprise. It is much like Montreal Market in type, differing from that variety in being smaller, less uniformly netted and usually less symmetrical. It is similar to Champion Market in many respects but is more oblate, somewhat more deeply furrowed and with brighter green flesh color.

Plant moderately vigorous; vines medium coarse and medium slender; branches moderately many.

Fruit moderately large, $6-6\frac{1}{2} \times 7-7\frac{1}{2}$ inches; weight $4\frac{1}{2}-5$ pounds. Shape oblate, flattened at base and apex; blossom scar moderately conspicuous; ribs prominent, $2-2\frac{1}{2}$ inches broad at the medial; furrows broad, moderately deep and smooth. Netting abundant, finely laced; cork moderately heavy, distributed uniformly over the ribs; interstices moderately deep. Skin color green, sparsely mottled with creamy yellow.

Flesh light green, medium thick, $1\frac{1}{4}$ inches; texture moderately coarse and fibrous, rather firm, medium juicy; sweet, rather mildly flavored, mild aroma; quality fair. Cavity moderately large, $3 \times 3\frac{1}{2}$ inches, circular in cross-section. Rind thick, $\frac{1}{4}$ inch, moderately strong and medium tough.

Christiana. Refs. 4, 12, 23, 24, 25, 26, 29, 31, 37, 38, 39, 43, 44, 45, 46, 49, 53, 55, 56, 90, 91, 96, 97, 98, 99, 100, 105, 107, 108, 109, 124, 127, 130, 133, 136, 138, 139, 144, 145. Syns. Boston Pet, Boston Sweet, Christiana Improved, Early Christiana, Early Improved Christiana, Early Orange Christiana, Extra Early Orange Christiana, Improved Orange Christiana, Mill's Earliest, Orange Christiana, Orange Fleshed Christiana.

The Massachusetts Horticultural Society in 1851 recognized the value of this melon through its premium awards for new varieties of merit. Christiana "not yet equalled" was raised by Capt. Josiah Lovett of Beverly, Massachusetts, from a green Malta, pollinated by a very early variety (Netted Nutmeg) and for which the society awarded fifty dollars. During the eighties an exceptionally fine strain was bred and introduced by Dr. E. L. Sturtevant at "Waskakum Farm" at South Framingham, Massachusetts. This variety is best suited for the home or family garden for to be at its best the fruit should be eaten just as it is ready to fall off the vine.

As a moderately early variety Christiana was 4-5 days earlier than Bender's Surprise, in season with Emerald Gem and about a week later than Fordhook and Golden Champlain. The fruits most resemble those of Golden Champlain, being somewhat less deeply furrowed, less uniformly netted and slightly smaller.

Plant moderately vigorous; vines moderately coarse and medium slender; branches moderately many.

Fruit moderately small, 5-5½ x 5-5½ inches; weight 2-2½ pounds. Shape globular, slightly flattened at base and apex; blossom scar corky, somewhat raised, rather conspicuous; ribs moderately prominent, 1¾ inches broad at the medial; furrows broad, medium deep and smooth. Netting medium in amount, finely interlaced, often in the form of short streaks; cork moderately light, unevenly distributed over the ribs; interstices moderately shallow. Skin color dull green mottled with golden brown.

Flesh orange, medium thick, 1¼ inches; texture medium fine, slightly fibrous, rather soft and juicy; very sweet, rather highly flavored, mild aroma; quality good. Cavity small, 2¾ x 2¼ inches, circular in cross-section. Rind medium thick, ⅜ inch, rather weak and tender.

Citron. Refs. 2, 20, 22, 24, 25, 26, 28, 30, 38, 44, 45, 46, 49, 53, 55, 57, 89, 90, 91, 96, 98, 99, 100, 101, 105, 127, 130, 133, 134, 136, 138, 139, 142, 145. Syns. Citron Nutmeg, Earliest of All, Early Citron, Early Green Citron, Extra Early Citron, Extra Early Citron Nutmeg, Extra Early Green Citron, First in Market, Green, Green Citron, Green Citron Nutmeg, Green Fleshed Citron, Green Netted Citron, Green Nutmeg, Improved Citron, Large Green Citron, Netted Cantaloupe, Netted Citron, Netted Green Citron, Netted Green Fleshed, Rock Citron.

Green Citron or Citron was, previous to the eighties, perhaps the most popular melon on the market; and for cultivation in the family garden, it had few superiors. It was included in the very earliest lists, appearing in M'Mahon's 1806 American Gardeners catalog, in the catalog of Thorburn for 1824 and of Hovey for 1834.

This variety undoubtedly was used for crossing with other varieties when earliness and quality were desired. It was one of the earliest to ripen in the garden and was often spoken of as "desirable in the garden till others came into condition."

This is one of the earliest sorts, maturing at Geneva a week earlier than Early Prolific Nutmeg, in season with Extra Early Hanover, and 2 or 3 days later than Early Bird. It is most like Early Prolific Nutmeg but is slightly more globular, slightly larger, more finely interlaced and more yellowish green in flesh color. It is much more globular than Jenny Lind but is similar in netting characteristics.

Plant medium vigorous; vines moderately slender; branches few.

Fruit moderately small, 4½-5 x 5-5½ inches; weight 2½-3 pounds. Shape nearly globular, very slightly flattened at base and apex; blossom scar rather conspicuous; ribs rather obscure, 1½ inches broad at the medial; furrows narrow, shallow and smooth. Netting sparse, medium finely interlaced; cork light, unevenly distributed over the ribs, base and apex; interstices shallow. Skin color dull yellowish brown sparsely mottled with green. Flesh very light green often with a pale yellowish cast; medium thick, 1 inch; texture medium coarse, fibrous, soft and juicy; very sweet, rather highly flavored and mildly aromatic; quality fair. Cavity moderately small, 3 x 2½ inches, circular in cross-section. Rind medium thick, ½ inch, rather soft and tender.

Clark.

George Tait & Sons, Norfolk, Virginia, offered the Clark melon in 1933 as an improved stock of Bottomly. Fruits were produced about the same season as Netted Gem. In many respects it was very similar to that variety and differed chiefly in having a distinctly heavier, more cord-like netting and in being somewhat more extended at the base.

Fruit small, 5½-6 x 4-4½ inches; weight 2-2¼ pounds. Shape oval, base slightly extended, apex rounded; blossom scar obscure, ribs prominent, 1½ inches broad at the medial; furrows narrow, shallow and smooth, often rather pubescent. Netting abundant, finely interlaced; cork very heavy and coarse, distributed uniformly over the ribs, base and apex; interstices very deep. Skin color dark green becoming dull orange at full maturity. Flesh green, thin, ⅞-1 inch, texture very coarse and fibrous, soft and juicy; sprightly, highly flavored, often strong, nauseous; quality fair to poor. Cavity moderately small, 3½ x 2½ inches, circular in cross-section. Rind thick, ¼ inch, strong and moderately tough.

Colorado Queen.

This melon, which is slightly larger than Burrell's Gem, was introduced in 1923 by the St. Louis Seed Co., St. Louis, Missouri. It is recommended as well suited to shipping.

It is a moderately late variety, 2-3 days earlier than Pollock 10-25, in season with Rocky Ford and 4-6 days later than Burrell's Gem. It is much like Burrell's Gem in shape although it is larger, more coarsely interlaced and more orange brown in skin color. The flesh is thinner than that of Rocky Ford but otherwise is much like it.

Fruit medium large, 7-7½ x 4½-5 inches, weight 3-3½ pounds. Shape oval, somewhat tapered at the ends; blossom scar rather obscure; ribs moderately prominent, 1½ inches broad at the medial; furrows medium broad, shallow and usually smooth to sparsely netted. Netting moderately abundant, medium coarsely



CHRISTIANA

(Three-fourths natural size)



interlaced, often streaked in parts; cork moderately light, distributed rather uniformly over the ribs, base and apex; interstices moderately shallow. Skin color deep yellow to orange brown, mottled sparsely with green. Flesh light green, medium thick, $1\frac{1}{4}$ – $1\frac{1}{2}$ inches; texture rather coarse and fibrous, soft and juicy; sweet, rather mildly flavored and faintly aromatic; quality fair. Cavity medium large, $4 \times 2\frac{1}{4}$ inches, circular in cross-section. Rind medium thick, $\frac{1}{8}$ inch, rather soft and medium strong.

Columbus. Refs. 10, 22, 29, 39, 53, 96, 98, 99, 100, 107, 133. Syns. Beck's Columbus, Christopher Columbus, Columbia, Columbus Green, Columbus Queen.

In 1892 A. W. Livingston's Sons, Columbus, Ohio, offered this new melon in their novelty list. The seed had been secured from a Mr. Antone Beck of Oregon, Illinois, who had grown this as his private stock for many years. The same year D. Landreth & Sons, Philadelphia, introduced a melon which they called Columbus as "an acclimated foreign melon." The descriptions of the two seemed somewhat similar, both being oval in shape, silvery green in skin color which later changes to golden, heavily netted and green fleshed.

The Aggeler & Musser Seed Co. of Los Angeles, California, offered in 1915 **Yellow Fleshed Columbus** which became quite popular. Later this was said to have come from a cross of Columbus and Tip Top. Reports indicate that the variety was much like the above except in color of flesh and in having superior texture.

Columbus was a late variety about in season with Texas Cannon Ball and 4–6 days later than Nixon. It was much like Texas Cannon Ball in shape and netting and differed from that variety in having a much more creamy yellow skin color. The interiors were much the same.

Fruit moderately small, $5\frac{1}{2}$ –6 \times $5\frac{1}{2}$ –6 inches; weight 4–4 $\frac{1}{2}$ pounds. Shape nearly globular, somewhat flattened at base and apex; blossom scar obscure; ribs and furrows obscure to absent. Netting moderately abundant, not interlaced very much, usually short streaked and in star-like formations, rather obscure because of skin color similarity; cork light, rather unevenly distributed over the surface. Skin color creamy buff. Flesh green, moderately thin, 1 – $1\frac{1}{4}$ inches; texture rather coarse and fibrous, firm, medium juicy; moderately sweet, highly flavored and mildly aromatic; quality fair to moderately good. Cavity small, $2\frac{1}{2} \times 2\frac{1}{2}$ inches, circular in cross-section. Rind thick, $\frac{1}{4}$ inch, tough and strong.

Cosmopolitan. Refs. 29, 53, 54, 96, 97, 98, 99, 100, 101, 105, 128, 133, 136, 140. Syns. Cannon Ball, "Silver Netted," Texas Cannon Ball.

D. M. Ferry & Co., Detroit, Michigan, introduced in 1894 a variety which they called Cosmopolitan. The new variety was selected at the Ferry Oakview trial grounds from Shumway's Silver Netted Cantaloupe. This variety, Silver Netted, had been listed for several years by R. H. Shumway of Rockford, Illinois, and was said to have come from a cross between an American muskmelon and a French cantaloupe. Ferry chose the name because the new selection had been originally derived from cosmopolitan parentage. W. Atlee Burpee listed Cosmopolitan in 1896, and in 1897 offered a new strain called Cannon Ball. In 1897 L. Templin of Calla,

Ohio, introduced Texas Cannon Ball as a novelty from Texas. This latter name is the name by which the type is generally known today.

Cosmopolitan is a late variety which matured at Geneva in season with Montreal Market and Giant and 4 or 5 days later than Nixon and Pollock 10–25. It is very similar to Texas Cannon Ball and Silver Netted, two varieties which were originally individual but in late years have been more or less indiscriminately mixed. The fruits are shaped much the same as those of Nixon, and differ from that variety in being more nearly globular, slightly larger, with the netting less abundant and interlaced and more inclined to be circular in pattern at the ends. The flesh is slightly more firm and lacks the orange tint about the cavity present in Nixon.

Plant vigorous; vines heavy and coarse; branches many.

Fruit medium large, 6 – $6\frac{1}{2} \times 6$ – $6\frac{1}{2}$ inches; weight $3\frac{1}{2}$ –4 pounds. Shape perfectly globular, base and apex very slightly flattened; blossom scar usually obscure; ribs and furrows absent. Netting rather sparse, short streaked and checked in star-like pattern, often circular at the ends; cork medium light, unevenly distributed over the surface; interstices moderately shallow. Skin color dark green, assuming bronze green at full maturity. Flesh light green; moderately thick, $1\frac{1}{2}$ – $1\frac{3}{4}$ inches; texture medium coarse and fibrous, firm and rather juicy; sweet, rather mildly flavored and mildly aromatic; quality fair. Cavity medium large, 3×3 inches, circular in cross-section. Rind thick, $\frac{1}{4}$ inch, moderately strong and tough.

Daisy. Refs. 54, 121.

This melon which was introduced in 1913 by Henry Field Seed Co., Shenandoah, Iowa, was probably a selection out of Emerald Gem for a larger and more globular fruit. The originator, Alfred Apfel, a market gardener in the northern part of Iowa, had found that it was apparently blight proof and grew well under drought conditions. D. M. Ferry & Co. from 1926 to 1933 offered Daisy as a melon whose quality "is the standard of excellence in muskmelons."

This is a moderately early to midseason sort about 3 or 4 days earlier than Bender's Surprise, in season with Sugar Rock and about a week later than Emerald Gem. In form and skin color it most resembles Emerald Gem. It differs from that variety in being more globular, less furrowed, less netted, and in retaining the green skin color much later, even past the full slip stage of maturity. The flesh is decidedly thicker in proportion to its size than in other varieties and is surpassed by few if any in all round quality.

Plant vigorous grower; vines moderately slender; branches medium in number; leaves distinctly crumpled.

Fruit moderately small, $5\frac{1}{2}$ –6 \times 5 – $5\frac{1}{2}$ inches; weight $2\frac{1}{2}$ – $3\frac{1}{2}$ pounds. Shape nearly globular; base and apex rounded and full, blossom scar rather conspicuous; ribs obscure, $1\frac{1}{2}$ inches broad at the medial; furrows narrow, very shallow and smooth. Netting rather sparse, moderately fine interlaced; cork light, unevenly distributed over the ribs; interstices very shallow. Skin color dark and rather glossy green, very sparsely mottled with pale yellowish brown when fully mature. Flesh deep orange to salmon orange, moderately thick, $1\frac{1}{2}$ – $1\frac{3}{4}$ inches; texture moderately fine, firm, moderately juicy; rather sweet, highly flavored, mild aroma, quality very good. Cavity very small, $2\frac{1}{2} \times 1\frac{3}{4}$ inches, distinctly triangular in cross-section. Rind thin, $\frac{1}{8}$ inch, moderately strong and medium tough.

Delicious. Refs. 37, 54, 95, 121. Syns. Extra Selected Delicious, Golden Delicious.

Delicious was introduced in 1925 by Chas. J. Lindholm, Minneapolis, Minnesota, as Golden Delicious. Jerome B. Rice Seed Co., Cambridge, New York, and Joseph Harris Company, Coldwater, New York, offered it as Delicious in 1930, and in 1935 Mr. Lindholm also dropped the word "Golden" from the title. Delicious is best described as an early strain of the famous Bender from which it was selected and which it resembles in many ways. For the home garden and local trade it has a very definite place in the list of varieties.

This is a moderately early variety about 5 or 6 days earlier than Bender's Surprise, in season with Extra Early Hackensack and Extra Early Osage and about a week later than Golden Champlain. It is most like Bender and differs from that variety in being smaller, less deeply furrowed, more finely netted and in having a much less prominent blossom scar.

Plant vigorous; vines moderately coarse and medium heavy; branches moderately many.

Fruit medium large, $6\frac{1}{2}$ -7 x 6 - $6\frac{1}{2}$ inches; weight 4-5 pounds. Shape nearly globular to short oval; base full; apex even; blossom scar rather obscure; ribs slightly prominent, 2 inches across the medial; furrows narrow, moderately shallow and smooth. Netting moderately abundant, rather finely laced; cork moderately light, distributed rather uniformly over the ribs; interstices moderately shallow. Skin color pale creamy yellow. Flesh orange, medium thick, $1\frac{1}{4}$ - $1\frac{1}{2}$ inches; texture moderately fine, slightly fibrous, moderately soft and juicy; sweet, mildly flavored, pleasant aroma; quality good. Cavity moderately small, $3\frac{1}{2}$ x $2\frac{1}{2}$ inches, circular in cross-section. Rind thick, $\frac{1}{4}$ inch, moderately strong, medium tough.

Delmonico. Refs. 4, 38, 40, 53, 83, 84, 88, 89, 91, 92, 98, 99, 100, 101, 106, 107, 125, 127, 128, 133, 144.

Named for Delmonico, the famous New York caterer, this melon was introduced in 1889 by Peter Henderson & Co. The original seed came from Waterloo, Nebraska, a section which at that time produced a large proportion of the vine seeds grown in this country. The Perfected Delmonico which came out nearly ten years later was a smaller melon more globular than the original Delmonico.

Delmonico was similar in shape and size to Osage, but differed from that variety in being decidedly heavier netted and having narrower, more uniformly netted ribs. It differs from Perfected Delmonico in being larger, much more oblong in shape, more heavily netted and more prominently ribbed.

Fruit moderately large, $7\frac{1}{2}$ -8 x $5\frac{1}{2}$ -6 inches; weight 4-5 pounds. Shape oval, slightly tapered at the apex; blossom scar obscure, ribs moderately prominent, $1\frac{1}{2}$ - $1\frac{3}{4}$ inches broad at the medial; furrows narrow, moderately shallow, netted. Netting abundant, uniformly and moderately coarse interlaced; cork moderately heavy and evenly distributed over the surface; interstices moderately deep. Skin color light orange yellow, rather green along the furrows. Flesh salmon orange; moderately thin, 1 - $1\frac{1}{4}$ inches; texture fine, firm, moderately juicy; moderately sweet, fair flavor, quality medium good. Cavity large, 4 x 3 inches, circular in cross-section. Rind thick, $\frac{1}{4}$ - $\frac{3}{8}$ inch, moderately tough and strong.

Early Bird.

This is an early, yellow-meated sort that was first offered in 1930 by the Iowa Seed Co., Des Moines, Iowa.

It is one of the very earliest melons at Geneva, maturing in season with Citron and Extra Early Hanover and about a week earlier than Fordhook and Jenny Lind. It most resembles Extra Early Hanover in shape, although it differs from that variety in flesh color, and is larger, more symmetrical and more uniformly netted. During wet years, Early Bird is rather susceptible to blossom-end cracking and for this reason has not been widely grown.

Plant vigorous; vines moderately slender, branches many.

Fruit moderately small, 6 - $6\frac{1}{2}$ x 5 - $5\frac{1}{2}$ inches; weight $2\frac{1}{2}$ -3 pounds. Shape very short oval to nearly globular; base full; apex even, somewhat inclined to crack, blossom scar rather conspicuous; ribs slightly prominent, $1\frac{1}{2}$ - $1\frac{3}{4}$ inches broad at the medial; furrows moderately narrow, rather shallow and netted. Netting abundant, moderately fine laced; cork moderately heavy, distributed over the entire fruit; interstices medium deep. Skin color green, sparsely mottled with golden brown at full maturity. Flesh orange, medium thick, $1\frac{1}{4}$ inches; texture medium fine, slightly fibrous, rather soft and juicy; sweet, rather highly flavored, mild aroma; quality good. Cavity moderately small, $2\frac{1}{2}$ x $2\frac{1}{4}$ inches, triangular in cross-section. Rind moderately thick, $\frac{3}{16}$ inch, moderately weak.

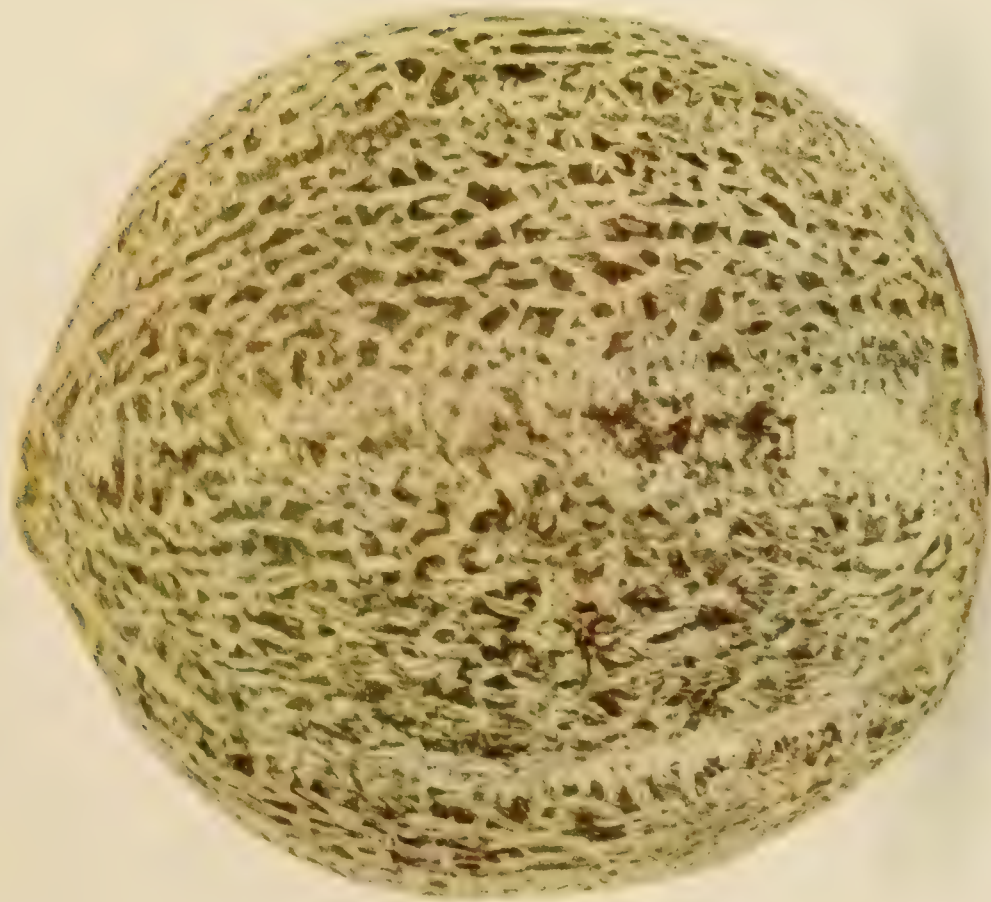
Edward's Perfecto. Refs. 15, 36, 54, 58, 64, 65, 79, 81, 105, 109, 110. Syns. Improved Perfecto, Improved Pink Meat, Orange Flesh, Orange Flesh Perfecto, Orange Flesh Superba, Perfected Perfecto, Perfecto, Superfecto.

This melon was developed from the Rocky Ford Eden Gem by J. R. Edwards of Rocky Ford, Colorado. Seed was offered by Ross Bros. Seed Co., Wichita, Kansas, in 1920, by Livingston in 1923, and by Burrell and Vaughan in 1924. This type of melon which was developed during the period of great expansion of the melon shipping business was only another step toward the ideal. Mr. Edwards continued selection work and from his stocks came other leading strains of shipping melons. The Superfecto offered first in 1926 came as the result of further selection by D. V. Burrell. The Perfected Perfecto and Improved Perfecto represent the most outstanding and leading strains of today. All of these selections had as an object a heavily netted, non-ribbed type with thick flesh of a delightful salmon-orange color and a very small seed cavity.

It is a moderately late variety maturing at Geneva 4-6 days earlier than Texas Cannonball, and 3-4 days later than Hale's Best. The fruits are somewhat more oval and slightly larger than Pollock 10-25 and very much like Hale's Best in shape and character of netting. The flesh is deeper orange than Hale's Best and usually not as thick, otherwise they are difficult to distinguish.

Plant medium in vigor; vines moderately slender; branches moderately few.

Fruit moderately small, 6 - $6\frac{1}{2}$ x 5 - $5\frac{1}{2}$ inches; weight $2\frac{1}{2}$ -3 pounds. Shape short oval to nearly globular, symmetrical, rounded at base and apex; blossom scar obscure; ribs and furrows absent. Netting abundant, moderately fine laced; cork medium heavy, distributed uniformly over the surface; interstices medium deep. Skin color dark green. Flesh salmon orange; medium thick, $1\frac{1}{4}$ - $1\frac{1}{2}$ inches, texture fine, fiberless, moderately firm and juicy; sweet, rather highly flavored and pleasantly aromatic; quality good. Cavity moderately small, 3 x 2 inches, triangular in cross-section. Rind medium thick, $\frac{1}{8}$ inch, strong and tough.





Emerald Gem. Refs. 4, 5, 6, 7, 13, 15, 22, 23, 25, 26, 27, 29, 33, 37, 38, 39, 41, 48, 49, 50, 51, 54, 58, 62, 69, 70, 75, 79, 83, 84, 88, 89, 91, 95, 96, 97, 98, 99, 100, 101, 102, 105, 106, 107, 108, 109, 121, 123, 124, 125, 127, 129, 133, 136, 140, 141, 142, 143, 144. Syns. Early Emerald Gem, Emerald Green, Giant Wonder Gem, Improved Emerald Gem, Mary Daisy.

The Emerald Gem melon was a chance seedling obtained by Wm. G. Voorhees of Benzie County, Michigan, who sent seed to W. Atlee Burpee. Named and introduced by this company in 1886, it soon became the most popular melon of that period. Melons indeed seemed to call forth words of praise unsuited to any other vegetable and the quality of this melon soon was admitted to be "unequalled in rich, delicious flavor" or "altogether unapproached in delicious flavor and luscious beyond description." Today Emerald Gem is known as one of the best second early varieties for home garden planting.

This is a moderately early variety, maturing at Geneva 6-7 days earlier than Bender's Surprise, in season with Delicious and Extra Early Hackensack, and about a week later than Golden Champlain. The fruits are less globular than Golden Champlain, distinctly less ribbed and very much less netted. It is much like Daisy in the immature stage, being less globular and as maturity is approached assumes a decidedly more brownish green appearance.

Plant moderately weak; vines slender; branches medium in number.

Fruit small, 4-4½ x 5-5½ inches; weight 2½-3 pounds. Shape nearly globular, slightly flattened at base and apex, blossom scar cork-like, rather conspicuous; ribs moderately prominent, 1¼-1½ inches broad at the medial; furrows narrow, medium deep and smooth. Netting very sparse, usually irregularly streaked, often patchy, moderately fine interlaced; cork very light, distributed unevenly over the ribs, base and apex; interstices very shallow. Skin color green, profusely mottled with brownish orange at full maturity. Flesh pale orange, medium thick, 1-1½ inches; texture fine, soft and juicy; sweet, somewhat spicy, mild aroma; quality good. Cavity small, 2½ x 2 inches, circular in cross-section. Rind medium thick, ⅛ inch, rather weak and tender.

Enid.

The Gurney Seed Co., Yankton, South Dakota, in 1908 introduced the Enid muskmelon. The name came from the town of Enid, Oklahoma, where the new variety originated. It was described as "one-half larger than Rocky Ford, one week earlier and twice as good."

Extra Early Grand Rapids. Refs. 53, 97, 98, 99, 100, 101, 105, 114, 133, 140. Syns. Early Grand Rapids, Early Grand Rapids Market, Extra Early Grand Rapids Market, Grand Rapids, Grand Rapids Market, New Grand Rapids.

Introduced in 1895 by Wm. Henry Maule, Philadelphia, Grand Rapids was favorably received because of its earliness. The original seed came from market gardeners near Grand Rapids, Michigan. There were two types of the Grand Rapids, the majority of the fruits were oblong but nearly one-fourth of the fruits were nearly round. In later years the longer type has

prevailed but because of lack of quality the variety has gradually been replaced by better sorts.

This was a moderately early variety which matured about 5-6 days earlier than Bender's Surprise, in season with Delicious and 6-8 days later than Golden Champlain. It resembled Burrell's Gem in shape, but was somewhat more oval at the ends, less profusely and uniformly netted, and had a skin much lighter in color.

Fruit moderately small, 6¾-7 x 4¾-5 inches; weight 2½-3 pounds. Shape oblong, moderately tapering at both ends; blossom scar conspicuous, corky; ribs moderately prominent, 1¼-1½ inches broad at the medial; furrows broad, medium deep and smooth. Netting moderately abundant, medium finely interlaced, often streaked; cork rather light, distributed rather evenly over the ribs, base and apex; interstices moderately shallow. Skin color creamy yellow, sparsely mottled with bronze green. Flesh orange, moderately thin, 1-1¼ inches; texture coarse and fibrous, medium soft and juicy; sweet, rather mildly flavored and mildly aromatic; quality fair to moderately good. Cavity moderately large, 4½ x 2½ inches, circular in cross-section. Rind moderately thin, ⅛ inch, medium soft and slightly tough.

Extra Early Hackensack. Refs. 4, 15, 22, 29, 53, 58, 62, 64, 79, 83, 88, 91, 92, 96, 98, 99, 100, 101, 105, 108, 109, 125, 133, 136, 140, 141, 143, 144, 146. Syns. Early Hackensack, Early Jersey Hackensack, Extra Early Improved Hackensack, Improved Early Hackensack, Large Early Hackensack, New Early Hackensack.

A few years after the Hackensack melon was generally distributed throughout the country, Peter Henderson & Co. offered a new strain which was a week to ten days earlier than the parent. The first selection was made about 1884 by a grower in the Hackensack, New Jersey, garden district. Henderson placed the seed in trial and after four years proved its earliness. It has become the standard green-fleshed early melon for home gardeners and truckers in that area.

It is a moderately early variety maturing about 6-8 days earlier than Hackensack, in season with Netted Gem and 6-8 days later than Early Green Nutmeg. The fruits are much like those of Hackensack but are smaller, more uniformly ribbed and have a trifle finer interlaced netting. The interior is the same in all respects, although Extra Early Hackensack is believed to have somewhat better quality.

Extra Early Hanover. Ref. 133.

Extra Early Hanover was introduced in 1895 by T. W. Woods & Sons of Richmond, Virginia. The variety originated in the vicinity of Richmond and its listing as an early sort has continued to the present. It is reported to have attained "immense popularity" and in the region of its origin, is noted for the sweet and sugary flavor of the flesh which can be eaten to the very thin skin.

It is one of the very earliest melons grown at Geneva, coming in season with Early Bird and Citron, and about a week earlier than Fordhook and Jenny Lind. In shape it most resembles Citron, although it is much less uniform, more inclined to be lopsided and more evenly netted than that variety. It is distinctly more oblate

than Early Bird and usually more coarsely and much less uniformly netted.

Plant medium in vigor; vines moderately slender; branches moderately few.

Fruit small, $4\frac{1}{2}$ –5 x 5–5 $\frac{1}{2}$ inches; weight 2–2 $\frac{1}{2}$ pounds. Shape oblate, often somewhat lopsided; blossom scar moderately conspicuous; ribs moderately prominent, irregular in width; furrows medium broad, irregular in depth, often netted. Netting medium in amount, rather coarsely and irregularly interlaced over the ribs; cork moderately heavy, irregularly distributed; interstices medium deep. Skin color brownish yellow, sparsely mottled with green. Flesh light green, blending to greenish yellow toward the cavity, thin, $\frac{3}{4}$ –1 inch; texture moderately coarse and slightly fibrous, soft and juicy; slightly sweet, poorly flavored, aroma lacking, quality poor. Cavity moderately small, 3 x 2 $\frac{1}{4}$ inches, circular in cross-section. Rind thick, $\frac{1}{4}$ inch, rather weak and tender.

Extra Early Osage. Refs. 37, 58, 79, 105, 109. Syns. Extra Early Osage Gem, Osage Early.

This variety was offered in 1907 by D. M. Ferry & Co., Detroit, as a "Special strain of Osage selected particularly for earliness." Inasmuch as the Osage melon was such a popular sort, the shortening of the period necessary to reach maturity was of great interest to growers in all regions.

It is a moderately early variety, about 6–8 days earlier than Osage, in season with Delicious, and 3–4 days later than Golden Champlain. It most resembles Osage in shape and skin color; however, it is smaller and more profusely netted than that variety. Many consider it distinctly superior to Osage in quality.

Fruit moderately small, 6–6 $\frac{1}{2}$ x 5–5 $\frac{1}{2}$ inches; weight 3 $\frac{1}{2}$ –4 pounds. Shape short oval to nearly globular, base full and slightly enlarged; apex even, blossom scar obscure; ribs moderately prominent, 1 $\frac{1}{2}$ inches broad at the medial; furrows distinct, narrow, medium depth and smooth. Netting moderately abundant, rather coarsely interlaced, often streaked in places; cork moderately light and distributed rather evenly over the ribs; interstices medium deep. Skin color dark green mottled with grayish green, particularly along the furrows, becoming mottled with yellowish brown at full maturity. Flesh salmon orange, moderately thick, 1 $\frac{1}{2}$ –1 $\frac{3}{4}$ inches; texture moderately fine, very slightly fibrous, moderately soft and juicy; sweet, rather highly flavored and pleasantly aromatic; quality very good. Cavity moderately small, 3 x 2 $\frac{1}{4}$ inches, circular in cross-section. Rind medium thick, $\frac{1}{8}$ inch, medium strong and rather tender.

Extra Early Sunrise.

This is a new melon offered in 1934 by C. J. Lindholm of Minneapolis, Minnesota. It is an early variety maturing 3–4 days earlier than Delicious, in season with Golden Champlain, and 4–6 days later than Early Bird. The fruits are more oval and less ribbed than those of Delicious, but the character of the netting and the color of the skin are very much the same.

Plant vigorous; vines moderately heavy; branches moderately many.

Fruit medium large, 6–7 x 5–6 inches; weight 3–3 $\frac{1}{2}$ pounds. Shape short oval, symmetrical, base and apex full; blossom scar conspicuous, corky; ribs slightly prominent, 1 $\frac{3}{4}$ inches broad at the medial; furrows very narrow, shallow and usually smooth. Netting medium abundant, coarsely interlaced; cork moderately heavy, distributed rather uniformly over the ribs and occasionally on the furrows; interstices medium deep. Skin color creamy yellow, very sparsely mottled with very pale green. Flesh orange; moderately thick, 1 $\frac{1}{2}$ –1 $\frac{3}{4}$ inches; texture slightly coarse and fibrous, soft and juicy; sweet, rather highly flavored, and mildly aromatic; quality

good. Cavity medium large, 3 $\frac{1}{2}$ x 2 $\frac{1}{2}$ inches, circular in cross-section. Rind thick, $\frac{1}{4}$ – $\frac{3}{8}$ inch, medium strong and medium tough.

Fordhook. Refs. 15, 54, 58, 69, 79, 95, 105, 109, 136.

Syns. Early Fordhook, New Fordhook, Sonderegger's Earliest, Sweet Martha, Yellow Fleshed Jenny Lind.

The Fordhook melon came from a cross between Emerald Gem and Improved Jenny Lind made by A. P. Owen, Cedar Dale Farm, Mickleton, New Jersey. The original cross was made about 1901, and in 1908 W. Atlee Burpee introduced the variety showing a fine color plate and devoting a full page to extolling its merits. It has proved to be one of the best of the small early orange-fleshed muskmelons.

As an early variety it usually precedes Golden Champlain by 2 or 3 days, but is 3 or 4 days later than Early Bird or Citron. The fruits are smaller and more oblate than those of Golden Champlain as well as being more coarsely netted. In many respects it resembles Jenny Lind, but the color of flesh and the fineness of the netting in the latter variety serves to distinguish the two. The fact that it has often been called a yellow-fleshed Jenny Lind will serve to indicate their similarity in exterior appearance.

Plant medium in vigor; vines moderately slender; branches moderately few.

Fruit moderately small, 4–5 x 5–6 inches; weight 1 $\frac{1}{2}$ –2 pounds. Shape definitely oblate, blossom scar corky, conspicuous; ribs moderately prominent, 1–1 $\frac{1}{2}$ inches broad at the medial; furrows narrow, medium deep and smooth. Netting moderately abundant, moderately fine interlaced; cork heavy, rather uniformly distributed over the ribs, base and apex; interstices moderately deep. Skin color dull yellowish brown profusely mottled with green. Flesh orange, moderately thin, 1–1 $\frac{1}{4}$ inches; texture slightly coarse and fibrous, moderately firm, juicy; sweet and rather highly flavored; quality good. Cavity moderately small, 2 x 3 inches, nearly circular in cross-section. Rind medium thick, $\frac{1}{8}$ – $\frac{1}{4}$ inch, moderately soft and rather weak.

Giant. Refs. 4, 9, 22, 29, 53, 89, 92, 96, 98, 99, 100, 101, 105, 125, 127, 133, 142. Syns. Enormous, Mammoth Giant, Market King, Michell's Delicious, Mill's Giant, New Giant, Salmon Giant, Shumway's Giant, Thorburn's Giant, Western Giant.

The date of the original introduction of this melon is not definitely known. However, it is listed in the catalogs of James J. H. Gregory for 1895 under the name "Shumway's Giant." In catalogs of 1892 Thorburn and Livingston describe a melon under the name New Giant which probably was the same variety. It was described as the "largest melon ever introduced, with the average size of the fruits as large as a water bucket." The variety is known today as the largest pink-meated sort, suited more for the home garden than for shipping.

This is one of the latest varieties, maturing in season with Texas Cannon Ball and Weaver Special, 2 or 3 days later than Montreal Market and a week to 10 days later than Bender's Surprise. It is shaped much like Montreal Market but is decidedly less netted and somewhat less deeply furrowed. The flesh is lighter orange than that of Bender's Surprise and is decidedly drier and less



FORDHOOK

Three-fourths natural size



desirable. It is the largest melon of all but its exceedingly poor eating and keeping qualities restrict its use under New York conditions.

Plant very vigorous; vines coarse and heavy; branches very many.

Fruit very large, 8-9 x 9-10 inches; weight 12-15 pounds. Shape oblate to nearly globular, base usually depressed, apex even; blossom scar large and conspicuous; ribs very prominent, 3 inches broad at the medial; furrows narrow, deep and smooth. Netting very sparse, usually streaked, somewhat circular at the base; cork very light, unevenly distributed over the ribs and the base; interstices very shallow. Skin color pale grayish green, turning to pale buff yellow at full maturity. Flesh pale orange; thick, $1\frac{3}{4}$ -2 inches; texture medium fine, rather granular and mealy, soft and juicy; moderately sweet, poorly flavored and very slightly aromatic, quality fair to poor. Cavity very large, 4 x 4 inches, circular in cross-section. Rind medium thick, $\frac{3}{8}$ inch, soft and weak.

Gold Coin. Refs. 58, 109. Syn. Bowman's Gold Coin.

Wm. Henry Maule of Philadelphia offered his customers seed of this new melon in 1900. It was called to Mr. Maule's attention through the interest of T. Greiner of La Salle, New York, editor of the *Practical Farmer*. A subscriber, Mr. Bowman, had discovered the melon 2 years earlier on his farm in Niagara County. It was supposed to have come from a cross between Emerald Gem and Acme. Early descriptions indicate that the stock was somewhat mixed but that the better melons were somewhat like Paul Rose.

It is a moderately early variety, 4-6 days earlier than Paul Rose, in season with Delicious and 8-10 days later than Early Bird. It is much like Paul Rose in shape, although fruits are slightly larger, more prominently ribbed and more coarsely interlaced than that variety.

Fruit medium large, $6\frac{1}{2}$ -7 x $5\frac{1}{2}$ -6 inches; weight $3\frac{1}{2}$ -4 pounds. Shape oval, base slightly enlarged, apex full; blossom scar obscure; ribs prominent, $1\frac{3}{4}$ inches broad at the medial; furrows broad, medium deep and smooth. Netting moderately abundant, medium finely interlaced; cork heavy, distributed rather evenly over the ribs, often rather streaked at the ends; interstices moderately deep. Skin color orange brown mottled with green. Flesh orange, moderately thin, $1\frac{1}{8}$ - $1\frac{1}{4}$ inches, texture medium coarse and fibrous, soft and juicy; sweet, rather highly flavored and mildly aromatic; quality moderately good. Cavity large, $4\frac{1}{2}$ x 3 inches, circular in cross-section. Rind medium thick, $\frac{1}{8}$ - $\frac{1}{4}$ inch, medium strong and moderately tough.

Golden Champlain. Refs. 27, 36, 37, 54, 58, 78, 79, 109, 121, 123. Syns. Champlain, Discovery, Earliana, Earliest, Golden Lake Champlain, Skagit Golden.

The development of Golden Champlain somewhat parallels that of Rocky Ford, Bender and Hale's Best. This variety as offered today is very similar to that of the original introduction in 1923; but the present stock represents certain progressive changes. "H. J. Walrath, the originator of Lake Champlain, continued his improvement work and in 1920 took pollen from Gold Nugget, previously known as Admiral Togo, and placed it on blossoms of Lake Champlain plants." Three years later seed was listed under the variety name Golden Champlain, as an improved Lake Champlain with deeper golden flesh.

This is an early variety which matured at Geneva a week or ten days earlier than Bender's Surprise, about in season with Fordhook and about a week later than Early Bird. The fruits most resemble those of Fordhook, being larger, more globular in shape, and less coarsely netted. In form they are decidedly more globular than Early Bird, more prominently ribbed and more deeply furrowed.

Plant medium in vigor; vines slender, branches medium number.

Fruit moderately small, 5-6 x 5-6 inches; weight 3-4 pounds. Shape nearly globular, slightly flattened at base and apex; blossom scar usually not conspicuous; ribs slightly prominent, $1\frac{1}{4}$ inches broad at the medial; furrows narrow, moderately shallow and smooth. Netting moderately abundant, rather finely interlaced; cork moderately heavy, somewhat irregularly distributed over the ribs and the ends; interstices medium deep. Skin color yellowish brown, profusely mottled with green. Flesh pale orange, medium thick, $1\frac{1}{4}$ - $1\frac{1}{2}$ inches; texture medium fine, slightly fibrous, moderately soft and juicy; sweet and medium flavor; quality moderately good. Cavity moderately small, 3 x $2\frac{1}{2}$ inches, circular in cross-section. Rind moderately thick, $\frac{1}{8}$ - $\frac{1}{4}$ inch, moderately firm but rather weak.

Golden Combination. Refs. 37, 121. Syn. Aristocrat.

The name of this new variety was chosen by the originator, J. W. Conrad of Rockbridge, Ohio, because of its origin as a cross between two other golden-fleshed varieties. Mr. Conrad in a letter stated that he had a number of varieties in a trial and that possibly Tip Top and Banquet were the parents. Nature made the cross and Mr. Conrad selected large fruits with thick orange meat, until locally the strain was known as "that thick meat melon." Stark Bros., Louisiana, Missouri, introduced it in 1927. Seed was offered in 1935 by C. J. Lindholm and in 1934 by Joseph Harris Company of Coldwater, New York, who had been making selections over a number of years to develop a more uniform stock. It is one of the most promising of the newer varieties.

This is a moderately late variety, maturing at Geneva 4 or 5 days later than Bender's Surprise, in season with Hale's Best and about 4 or 5 days earlier than Montreal Market. The fruits are fully as large as Bender's Surprise, but are more globular, distinctly less deeply furrowed and have a thinner grayish green skin as contrasted with the pale creamy yellow skin of the Bender. The flesh is thicker and equally as good, if not better in texture and flavor.

Plant vigorous; vines moderately heavy; branches moderately many.

Fruit large, $7\frac{1}{2}$ -8 x 7-8 inches; weight 6-7 pounds. Shape globular to short oval; base and apex rounded to slightly flattened, blossom scar conspicuous; ribs moderately prominent, 2- $2\frac{1}{2}$ inches broad at the medial; furrows medium broad, moderately shallow and netted. Netting abundant, very coarsely interlaced, often circular in pattern at the base and apex; cork broad and heavy, usually creased, distributed uniformly over the entire fruit; interstices moderately deep. Skin color distinctly grayish green, sparsely mottled with pale yellow very late in maturity. Flesh orange, very thick, 2- $2\frac{1}{4}$ inches; texture moderately fine, slightly fibrous, soft and very juicy; sweet, rather highly flavored with pleasant aroma; quality very good. Cavity moderately large, $3\frac{1}{2}$ x 3 inches, circular in cross-section. Rind thin, $\frac{1}{8}$ - $\frac{3}{16}$ inch, rather weak and tender.

Golden Cream.

This melon was first offered in 1923 by Gill Bros. Seed Co., Portland, Oregon. Little is known of the history of the variety.

This is a moderately early variety, about 5 or 6 days earlier than Bender's Surprise, in season with Delicious and Extra Early Osage and about a week later than Fordhook. The fruits are most like Extra Early Osage in shape but differ from that variety in having much less but coarser netting and a distinctly pale creamy yellow (instead of dark brownish green) skin. The flesh is thicker, rather lighter orange in color and more distinctly flavored.

Plant medium in vigor; vines moderately coarse; branches few.

Fruit medium large, 7-7½ x 5-5½ inches; weight 3½-4 pounds. Shape nearly ovate, base slightly enlarged; blossom scar obscure; ribs absent; furrows absent. Netting moderately sparse, very coarsely interlaced, often streaked without cross lacing; cork moderately light, distributed unevenly over the surface; interstices shallow. Skin color creamy yellow. Flesh pale pinkish orange; moderately thick, 1½-1¾ inches; texture very fine, not fibrous, moderately soft and juicy; moderately sweet, somewhat sprightly and acid, rather highly flavored and rather pleasantly aromatic; quality fair; cavity moderately small, 3½ x 2¼ inches; triangular in cross-section. Rind medium thick, ⅛-¼ inch, rather weak and tender.

Golden Eagle. Refs. 29, 53, 69, 97, 99, 100, 101, 109, 133, 140.

Golden Eagle, introduced in 1898 by W. Atlee Burpee, was a rather attractive melon yet never became exceedingly popular, possibly because of the many new sorts which were being offered about that time.

It is a midseason variety, maturing about 4-6 days earlier than Hale's Best, in season with Golden Queen and Bender's Surprise, and 6-8 days later than Emerald Gem. It is similar in shape to Hale's Best, being more coarsely netted and more deeply furrowed. The skin and flesh color is much like that of Emerald Gem at full maturity. Oblate-shaped fruits, very much like Greeley Wonder in type, occasionally appear.

Fruit moderately small, 5¾-6 x 4½-4¾ inches; weight 2-2½ pounds. Shape oval, base very slightly extended; apex rounded; blossom scar obscure; ribs slightly prominent, 1½-1¾ inches broad at the medial; furrows narrow, moderately shallow and finely netted or streaked. Netting medium abundant, rather coarsely interlaced, usually predominating in short longitudinal streaks which are barely intertwined; cork medium heavy and rather uniformly distributed over the ribs, base and apex. Skin color dark green moderately blotched with dull orange buff at full maturity. Flesh orange, moderately thin, 1⅛-1¼ inches; texture rather coarse and somewhat fibrous, moderately soft and juicy; sweet, rather mildly flavored and mildly aromatic; quality fair. Cavity moderately small, 3 x 2 inches, triangular in cross-section. Rind thick, ¼ inch, medium strong and rather tough.

Golden Osage. Syn. New Golden Osage.

New Golden Osage was an introduction in 1933 of Chas. J. Lindholm of Minneapolis, Minnesota. Little is known concerning the history of the variety, other than that it represents a strain of Osage selected for superior qualities. It has continued to be popular in the Minneapolis section and undoubtedly has merit.

This is a midseason variety which matures 2 or 3 days earlier than Osage, in season with Sugar Rock and

4-6 days later than Extra Early Osage. It is similar in shape to Osage, although somewhat less enlarged at the base. The skin color is a more creamy yellow than in that variety and is more like that of Bender's Surprise, as is the character of the netting.

Fruit medium large, 7-7½ x 5-5½ inches; weight 3½-4 pounds. Shape oval, base full and slightly extended; apex even; blossom scar conspicuous; ribs obscure, 1½ inches broad at the medial; furrows broad, very shallow and smooth. Netting moderately abundant, coarsely interlaced; cork medium heavy, unevenly distributed over the ribs, base and apex; interstices moderately shallow. Skin color creamy yellow. Flesh pale orange, medium thick, 1¼-1½ inches; texture medium coarse and moderately fibrous, medium firm and juicy; sweet, mildly flavored and mildly aromatic; quality good. Cavity medium large, 4 x 2 inches, circular in cross-section. Rind thick, ¼-⅓ inch, rather soft and tender.

Golden Oval. Ref. 121.

The G. H. Wilson Seed Co. of Downs, Kansas, has during the last few years introduced several new varieties of muskmelons. These include Black African, Wilson Black, Solomon Giant, Ivory Wonder, Perfect, and Mammoth Black Oak. Of those tested at Geneva, the Golden Oval seems the most promising. It is claimed to be a hybrid coming from a cross between Pollock 10-25 and Shumway's Giant. Its partial resistance to melon mosaic is of interest.

It is a midseason variety, maturing 4-6 days earlier than Golden Combination, in season with Hearts O'Gold, and 6-8 days later than Delicious. To some extent it resembles Hale's Best in shape, but is somewhat more enlarged at the base and tapered at the apex. The netting on most of the fruits is lighter and more finely interlaced than on Hale's Best, although on some it is heavier and more coarsely interlaced. It is fully as thick-fleshed and of equal quality. Its tendency to split, however, will limit its area of adaptability.

Plant very vigorous; vines moderately heavy and coarse; branches moderately many.

Fruit medium large, 6-7 x 5½-6 inches; weight 3-3½ pounds. Shape short oval, symmetrical, base slightly enlarged and full; blossom scar rather prominent. Ribs rather obscure, 1¾ inches broad at medial; furrows narrow, very shallow and netted. Netting abundant, rather finely interlaced, about 40 per cent of fruits have coarsely interlaced net which is often streaked; cork medium heavy and distributed uniformly over the surface; interstices moderately shallow. Skin color creamy yellow. Flesh orange; moderately thick, 1⅜-1⅝ inches; texture fine, slightly fibrous, firm, juicy; sweet, very highly flavored and pleasantly aromatic; quality very good. Cavity moderately small, 3 x 2½ inches, circular in cross-section. Rind moderately thin, ⅛ inch, strong and tough.

Grand. Ref. 136. Syns. Davis Grand, Improved Davis Grand.

Horace B. Davis of Leoni Township, Jackson County, Michigan, discovered a single plant in a field of Osage melons which produced fruits several days earlier than and slightly different in color from the genuine Osage. It was named the Grand and in 1907 distributed by S. M. Isbell & Co., Jackson, Michigan, and by the Livingston Seed Co., Columbus, Ohio. For nearly twenty years it was one of the leading varieties grown in Michigan but was never widely grown in other districts.

It was a moderately early variety which matured 5-6 days earlier than Osage, in season with Delicious, and

4-6 days later than Golden Champlain. It resembled Osage in general appearance, but was more globular than that variety and had a distinctly lighter green skin color and a deeper orange flesh.

Fruit medium large, 6-6½ x 6½-6¾ inches; weight 2-2½ pounds. Shape globular, base slightly depressed, apex rounded; blossom scar rather obscure; ribs prominent, 1½ inches broad at the medial; furrows broad, moderately shallow and smooth. Netting medium in amount, patchy, rather finely interlaced in some areas, often streaked; cork light, distributed unevenly over the ribs; interstices shallow. Skin color pea green. Flesh deep orange, moderately thin, 1-1½ inches; texture fine, rather fibrous, firm and rather juicy; very sweet, highly flavored and mildly aromatic; quality very good. Cavity medium large, circular in cross-section. Rind moderately thick, ¼ inch, strong and medium tough.

Greeley Wonder. Refs. 54, 58, 79, 105, 108, 109, 139.

Syns. Golden Queen, New Perfect Leader, Perfect Leader, Reuter's Wonder, Unsurpassed.

With the statement "looks like a Hackensack but cuts like Osage," Henry Field Seed Co., Shenandoah, Iowa, in 1917 offered seed of this new melon to their customers. It originated near Greeley, Colorado, and although rather late in maturing, was large and of good quality. The Livingston Seed Co. has listed the variety for many years.

This is a midseason variety, about the same season as Bender's Surprise, 4 or 5 days later than Delicious and a few days earlier than Hale's Best. The fruits are more globular than those of Bender's Surprise, have somewhat less prominent ribs and furrows, and are much more uniformly netted.

Plant vigorous; vines moderately coarse and heavy; branches moderately many.

Fruit moderately large, 6½-7 x 6¼-6¾ inches; weight 4½-5 pounds. Shape globular, full at base and apex; blossom scar usually obscure; ribs moderately prominent, 1½ inches broad at the medial; furrows moderately broad, medium deep and usually smooth. Netting moderately abundant, interlaced rather coarsely; cork moderately heavy, distributed moderately uniformly over the ribs, base and apex; interstices golden brown, sparsely mottled with green. Flesh pale orange, medium thick, 1¼-1½ inches; texture fine, slightly fibrous, soft and juicy; sweet, medium flavor, mild aroma, quality fair to moderately good. Cavity large, 4 x 3½ inches, circular in cross-section. Rind thick, ¼ inch, moderately strong and rather tough.

Green Fleshed. Refs. 24, 42, 86, 133. Syn. Improved Green Fleshed.

This variety bears out the sentiments of J. C. Loudon, the author of *An Encyclopedia of Gardening*, who in 1850 wrote "the sorts which may be fashionable at one period, may be known only historically at another." Green Fleshed described by him as a very excellent variety exists now in name only.

Green Fleshed Osage. Refs. 11, 29, 53, 97, 98, 99, 100, 101, 105, 133, 140.

Chauncey P. Coy of Waterloo, Nebraska, who at one time was a grower of large quantities of muskmelon seed, found a green-fleshed fruit in a field of Osage. This was carefully saved and planted; a selection from this was offered, with an excellent illustration, in the 1893 catalog of Johnson & Stokes. Except for the color of the flesh it has proved to be identical with Osage.

Hackensack. Refs. 7, 15, 23, 25, 26, 28, 29, 38, 39, 43, 44, 45, 46, 49, 53, 58, 65, 70, 73, 75, 89, 90, 91, 93, 94, 95, 96, 98, 99, 100, 103, 104, 105, 107, 108, 109, 124, 127, 128, 129, 133, 135, 136, 142, 143, 144, 146. Syns. Early Leader, Hackensack Nutmeg, Improved Hackensack, Large Hackensack, Large Late Hackensack, Late Hackensack, New England Hackensack, Turk's Cap.

The Hackensack melon, for a time the most popular green-fleshed melon grown for the New York market, was first distributed about 1882 by Peter Henderson & Co. It received its name from the New Jersey region across the Hudson from New York. It was here originated about 1870, probably as a selection from Green Citron, a variety it most resembled; but it was 10 years later before seed was offered for sale by the trade. As grown by the early gardeners it was also known as Hackensack Nutmeg, or Turk's Cap. It has remained in cultivation these many years and although known today as Large Hackensack it continues to be one of the largest and finest of the green-fleshed sorts.

At Geneva, Hackensack can be considered a mid-season variety, reaching maturity about the same time as Bender's Surprise and 10 days to 2 weeks later than Early Green Nutmeg and Jenny Lind. The fruits are similar in shape to those of Early Green Nutmeg and somewhat like those of Montreal Market in shape and character of netting. It differs from the latter in being more distinctly oblate, somewhat smaller, and more yellowish green in flesh color. It is about a week later than Extra Early Hackensack, and is larger, more coarsely netted and interlaced, and less uniform in degree of ribbing than that variety.

Plant vigorous; vines moderately heavy and coarse; branches many.

Fruit moderately large, 5½-6 x 7-8 inches; weight 5-6 pounds. Shape distinctly oblate, occasionally somewhat lopsided, blossom scar conspicuous; ribs prominent, 2 inches broad at the medial; furrows moderately broad, deep and smooth. Netting abundant, interlaced moderately coarse; cork heavy, distributed uniformly over the ribs, base and apex; interstices moderately deep. Skin color golden yellow, mottled profusely with green. Flesh light green blending into yellowish green near the cavity, moderately thick, 1½ inches; texture coarse, very fibrous, moderately juicy and soft; sweet, rather highly flavored and mildly aromatic; quality fair to moderately good. Cavity medium large, 3 x 3½ inches, circular in cross-section. Rind thick, ¼ inch, medium strong and moderately tough.

Hale's Best. Refs. 29, 36, 37, 54, 58, 64, 65, 77, 78, 79, 81, 95, 105, 109, 110, 121. Syns. Early Imperial, Early May, Extra Early Hale's Best, First on the Market, Giant Wonder Gem, Gold Dollar, Golden Ice Cream, H. B., Imperial 50-15, Netted Nugget, New Ideal, 101 Special, Pink Queen, Prizetaker.

The discovery of Hale's Best was due to the alert observations of I. D. Hale of California. Mr. Hale at one time lived at Rocky Ford but moved to California and was a representative of the C. B. Weaver Co. of Chicago, one of the largest cantaloupe distributors operating in the Imperial Valley. According to Mr. Hale's

report, a certain Japanese truck grower near Brawley invariably had the first ripe melons from that section. He found that this Japanese had started with several varieties of melons and that he had been saving his own seed from a somewhat mixed assortment of types. Some seed of the very earliest was planted in 1923 at Brawley and proved to be a week earlier than any of the commercial sorts grown. Some of these fruits were also shipped to the Rocky Ford Cantaloupe Seed Breeders Association, seed was saved and planted under the supervision of James B. Ryan, an officer of the company, and again the crop produced the best combination of earliness and good shipping type yet observed. No effort was lost in multiplying the seed rapidly by growing in both Colorado and California, and in 1924 the new melon was designated "Hale's Best" or "H. B."

The original Hale's Best was slightly mixed in some characters, and continued selection has resulted in the introduction of several well known strains, notably No. 10, No. 36, No. 112, No. 9-36 and Seed Breeders, the most recent improvement introduced in 1936. The older type is maintained as the "Old Regular H. B.," or as the "Jumbo Strain." Outstanding characteristics which place this variety at the very top of all shipping melons are its earliness, the attractive well netted fruits, the thick firm deep golden-colored flesh, its sweetness, and the ability to maintain much of its fine quality even into the over-ripe stage.

Considerable diversity exists between strains of Hale's Best in respect to the number of days required to reach edible maturity. The average stock, however, may be considered a midseason variety, maturing slightly later than Bender's Surprise and several days earlier than Edwards Perfecto and Superfecto. The fruits are similar to those of Edwards Perfecto, differing from that variety in being more oval in shape and having heavier and more finely interlaced netting. The flesh is slightly thicker and is usually somewhat better quality.

Plant moderately vigorous; vines medium heavy; branches moderately many.

Fruit moderately small, 6-6½ x 5-5½ inches; weight 2-2½ pounds. Shape short oval, often nearly globular, blossom scar obscure; ribs and furrows absent. Netting very abundant, very finely interlaced; cork heavy, distributed uniformly over the entire fruit; interstices deep. Skin color dark green; sparsely mottled with creamy yellow at full maturity. Flesh orange, moderately thick, 1½-1¾ inches, texture fine, fiberless, firm, rather juicy; sweet, slightly sprightly, rather highly flavored and pleasantly aromatic; quality very good. Cavity very small, 3 x 1½ inches, somewhat triangular in cross-section. Rind medium thick, ⅛ inch, very strong and tough.

Hearts of Gold. Refs. 15, 27, 36, 37, 54, 58, 64, 65, 78, 79, 105, 109, 110, 121, 123. Syns. Golden Hearted, Golden Hearts, Improved Hoo Doo, New Arizona, Perry's New Hoodoo, Yellowmeated Prize.

The Osage and the Hearts of Gold muskmelon exist today as the result of the careful selection work of Roland Morrill of Benton Harbor, Michigan. Crosses between Osage and Netted Gem about 1890 produced the type now known as the Hoodoo group. The Paul

Rose, selected from one cross by a grower of that name, became the leading variety of its day. From another cross Mr. Morrill developed the variety which he named Hearts of Gold, and for which he was granted on Dec. 15, 1914, Trade Mark No. 101487 by the Patent Office at Washington, D. C. This melon, while similar to the Hoodoo, was slightly different and as the name became more familiar to growers and market men, Hearts of Gold replaced those strains which had been known as Improved Hoodoo, etc. In the catalog of Jerome B. Rice for 1917 the name occurs thuswise, Hoodoo (Hearts of Gold). Maule listed it in 1920, Burrell in 1921, and Ferry in 1924. The variety today is the most popular melon grown in Michigan.

This is a midseason variety, reaching maturity at Geneva a few days later than Bender's Surprise and Hale's Best. The fruits are slightly larger than those of Hale's Best and differ from that variety in being thicker at the base, less heavily netted, much more distinctly ribbed and more prominently furrowed, the latter depressions usually being entirely free of netting. The flesh is much the same in color but that of Hearts of Gold is somewhat thicker at the base and apex.

Plant moderately vigorous; vines moderately coarse and heavy; branches moderately many.

Fruit moderately small, 5½-6 x 5½-6 inches; weight 2-2½ pounds. Shape cordate to nearly globular, blossom scar moderately conspicuous; ribs moderately prominent, 1½-1¾ inches broad at the medial; furrows narrow, moderately shallow and smooth. Netting abundant, very finely laced; cork medium heavy, distributed uniformly over ribs, base and apex; interstices medium deep. Skin color dark green. Flesh orange, moderately thick, 1½-1¾ inches; texture fine, very slightly fibrous, firm, moderately juicy; sweet, somewhat sprightly, rather highly flavored and aromatic; quality very good. Cavity small, 2½ x 2¼ inches, triangular in cross-section. Rind medium thick, ⅛ inch, dark green, moderately strong and tough.

Hollybrook Luscious.

This is one of the largest of all melons. It was introduced in 1905 by T. W. Wood & Sons, Richmond, Virginia, and was named from their home seed farm, Hollybrook Farm. This melon is rather late and probably better suited to conditions farther south than New York State. It is strictly a home garden variety as the melons are frequently misshapen and not attractive in appearance.

It is a moderately late variety, maturing 4-6 days earlier than Montreal Market, in season with Nixon and Ohio Sugar, and about a week later than Bender's Surprise. It is nearly as oblong as Bay State, decidedly darker green in skin color, more deeply furrowed and less uniform in netting. The flesh is slightly paler orange than that of Bender's Surprise and fully as good quality. Its tender skin and irregularity has limited its usage to the home garden.

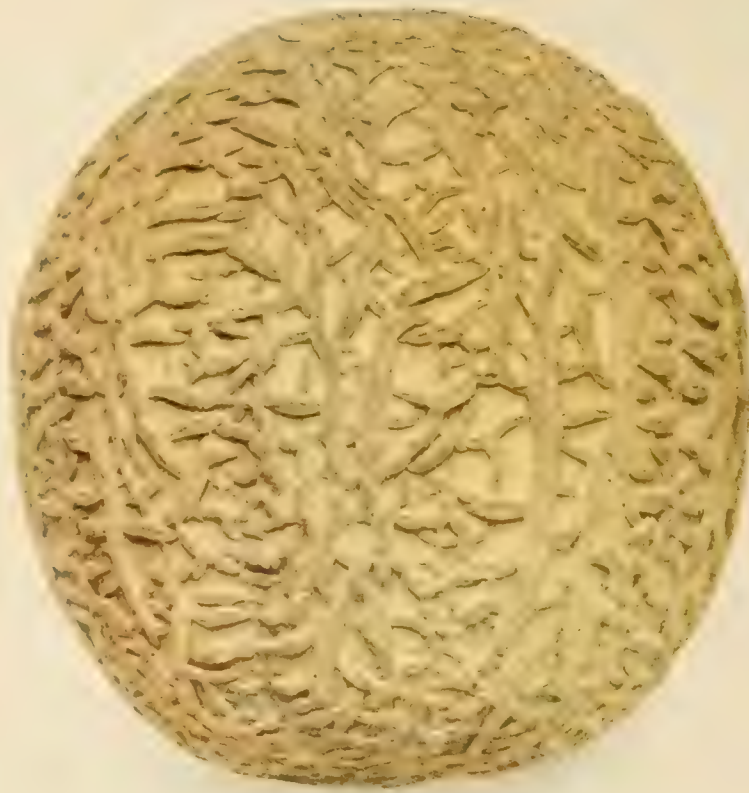
Plant vigorous; vines very coarse and heavy; branches moderately few; leaves very large.

Fruit large, 8-9 x 6½-7 inches; weight 6-7 pounds. Shape short oval to oblong, often rather irregular; base full; apex even; blossom scar moderately conspicuous; ribs very prominent, 2½ inches broad at the medial, not very uniform; furrows narrow, very deep and smooth. Netting sparse, finely interlaced, often in the



KINSMAN QUEEN

(Two-thirds natural size)



HONEY ROCK (upper)

GOLDEN CHAMPLAIN

(Two-thirds natural size)

form of hort streaks; cork light, unevenly distributed over the ribs; interstices shallow. Skin color dark green changing to burnt orange at full maturity. Flesh pale orange, moderately thick, $1\frac{1}{2}$ – $1\frac{3}{4}$ inches; texture fine, fiberless, soft and juicy; sweet, rather highly flavored and pleasantly aromatic; quality good. Cavity large, $5 \times 3\frac{1}{2}$ inches, circular in cross-section. Rind medium thick, $\frac{1}{8}$ inch, weak and rather soft.

Honey. Ref. 30. Syn. New Honey.

This melon belongs in the Hackensack group and was named in 1904 by Wm. Henry Maule as the result of a competitive contest. The original seed came from Georgia and the variety attracted new friends because of the name.

It is a moderately early variety, maturing about 3–4 days earlier than Acme, in season with Anne Arundel and 6–8 days later than Early Green Nutmeg. The fruits are most like those of the latter variety, being more globular in shape and having a much less prominent blossom scar and more finely interlaced netting.

Fruit moderately small, $5\text{--}5\frac{1}{2} \times 5\text{--}5\frac{1}{2}$ inches; weight $2\frac{3}{4}$ –3 pounds. Shape globular, slightly flattened at the ends; blossom scar obscure; ribs rather obscure, $1\frac{1}{2}$ – $1\frac{3}{4}$ inches broad at the medial; furrows narrow, shallow and smooth. Netting moderately abundant, often rather finely interlaced; cork moderately heavy, distributed uniformly over the ribs; interstices medium deep. Skin color dull yellowish brown sparsely mottled with green. Flesh light green, moderately thin, $1\text{--}1\frac{1}{4}$ inches; texture fine, slightly fibrous, moderately soft and juicy; rather insipid, poorly flavored and undesirable aroma; quality poor. Cavity medium large, 3×3 inches, circular in cross-section. Rind moderately thick, $\frac{1}{4}$ inch, moderately strong and medium tough.

Honey Ball. Refs. 15, 28, 35, 44, 45, 48, 54, 60, 80, 91, 95, 105, 108, 109, 133, 139. Syns. Golden Perfection, Texas Honey Ball.

According to a letter published in the *Market Growers Journal* (186) Honeyball is in reality the old variety described by Robinson and by Vilmorin as Golden Perfection.

As Honey Ball, the variety was introduced in 1925 by several seedsmen including Robert Nicholson Seed Co., Dallas, Texas, H. G. Hastings Co., Atlanta, Georgia, Grand Junction Seed Co., Grand Junction, Colorado, and Aggeler & Musser, Los Angeles, California. In all of the early accounts of the variety, it was said to have originated as the result of a cross between Honey Dew and Texas Cannonball made by W. H. Parker of Arlington, Texas. Mr. Parker in 1917 planted these two varieties and whether a natural cross occurred or a few seed of Golden Perfection had been mixed with the Honey Dew is not known. To Mr. Parker is given the credit for developing the variety.

This is about the latest melon which can be matured in New York State, being 10 days or 2 weeks later than Montreal Market and about a week later than Weaver Special. It is most like Honey Dew in type, being smaller, more uniformly globular, more netted and has flesh which is thinner and paler green in color.

Plant vigorous; vines very coarse and heavy; branches moderately many; leaves rather yellowish green, usually crumpled and have the terminal lobe much more prominent than the other four.

Fruit moderately small, $5\text{--}5\frac{1}{2} \times 5\text{--}5\frac{1}{2}$ inches; weight $2\text{--}2\frac{1}{2}$ occasionally 3 pounds. Shape globular, symmetrical, base and apex

rounded; blossom scar obscure; ribs and furrows absent. Surface very pubescent until very nearly mature. Netting very sparse, coarsely streaked and interlaced; cork very light, distributed unevenly over the surface. Skin color pale yellowish green, profusely stippled pale creamy green, turning to yellowish white at full maturity. Flesh pale green, medium thick, $1\frac{1}{4}$ – $1\frac{1}{2}$ inches; texture fine, firm and moderately juicy; sweet, honey-like flavor and mildly aromatic; quality good. Cavity small, $2\frac{1}{2} \times 2\frac{1}{2}$ inches, circular in cross-section. Rind thin, $\frac{1}{8}$ inch, very firm, strong and tough.

Honey Dew. Refs. 15, 54, 64, 76, 80, 95, 105, 109, 110, 129, 139, 143. Syn. White Antibes Winter.

Honey Dew is an American name for the French variety, White Antibes. The well-known French seedsmen Vilmorin Andrieux & Co. have listed the variety for perhaps fifty years. L. H. Bailey at Cornell University grew it in trials about 30 years ago but it proved unsuited for growth under eastern conditions.

In 1911 seed from an imported melon served in a hotel in New York was saved and sent to John Gauger of Swink, Colorado. This seed was planted alongside Netted Gem and Casaba and Mr. Gauger thought the varieties had hybridized. Dr. D. N. Shoemaker of the Bureau of Plant Industry of the United States Department of Agriculture believed that no hybridization had taken place and that the new melon was in reality the White Antibes grown for years in the south of France and in Algeria for foreign shipment. In 1915 Mr. Gauger named his melon Honey Dew and since then the variety has taken the lead in the winter melon group. D. V. Burrell was one of the first seedsmen to catalog the variety.

The New York State season is usually too short for this variety. It is most like Honey Ball in type, being considerably larger, less netted and often having a brighter yellow skin color and deeper green flesh.

Plant vigorous; vines coarse and heavy; branches moderately many; leaves large, often $6\frac{1}{2}$ inches long and nearly as broad; surface blistered; color moderately bright, rather yellowish green.

Fruit large, $7\text{--}8 \times 6\frac{1}{2}\text{--}7\frac{1}{2}$ inches; weight 5–7 pounds. Shape nearly globular, often slightly oval; base and apex rounded; blossom scar obscure; ribs and furrows absent. Surface smooth with an occasional streak of cork-like net evident. Skin color pale yellowish green, later becoming creamy yellow to rather bright yellow at full maturity. Flesh light emerald green, thick, $1\frac{3}{4}$ –2 inches; texture fine, crisp, firm and juicy; very sweet, honey-like flavor and mildly aromatic; quality very good. Cavity medium large, $3\frac{1}{2} \times 3$ inches, circular in cross-section. Rind very thin, $\frac{1}{16}$ – $\frac{1}{8}$ inch, firm and tough.

Honey Rock. Refs. 36, 37, 54, 65, 68, 78, 121. Syns. New Sugar Rock, Sugar Rock, Superba, White Seeded Delicious.

Previous to 1920 F. W. Richardson, owner of "Wartenbee Farm" near Hicksville, Ohio, had been improving his strain of Irondequoit melons. A field of this improved stock was planted adjacent to a field of Honey Dew and selections were made from this field of Irondequoit and planted the next year on the same farm. In this planting there were many hills that produced melons that looked like Honey Dews but that had the flesh characteristics of Irondequoit. The best fruits of this apparent cross were selected and seed

planted in the middle of a large field of Golden Champlain. A mass selection for seed was made from the Golden Champlain field and part of the seed sent to his son, G. A. Richardson of Ocala, Florida. In a field of this Florida planting Mr. Richardson found three hills of a thick rinded, ropy-netted melon. Seed from these three hills was saved, planted, and produced melons of every conceivable type. The best selection possible was made and seed sent to one of the Richardson farms near Howe in the St. Joe River Valley, Indiana. Further selections were made and finally in 1925 a selection was named Honey Rock and found its way into the trade. In the succeeding ten years it has become very popular in Indiana, Michigan and other sections.

It is a midseason variety maturing at Geneva 2 or 3 days earlier than Bender's Surprise, in season with Milwaukee Market and 3-4 days later than Delicious. It has the shape of Daisy and Perfecto, a netting most like that of Abbott's Pearl and the skin color of Golden Combination and Oregon Delicious. The flesh is like that of the Bender in color but is somewhat more firm than in that variety.

Plant moderately vigorous; vines moderately coarse; branches many.

Fruit moderately small, $5\frac{1}{2}$ -6 x $5\frac{1}{2}$ -6 inches; weight $2\frac{1}{2}$ -3 pounds. Shape globular; base full; apex even, often terminating in a small protuberance from which radiate streaks of netting in more or less spoke-like fashion; ribs obscure to nearly absent; furrows obscure. Netting abundant, coarsely interlaced, occasionally streaked, somewhat circular in pattern at the base; cork very heavy, distributed moderately uniform over the entire fruit; interstices large and deep. Skin color pale grayish green, changing to pale cream at full maturity. Flesh orange, medium thick, $1\frac{1}{4}$ - $1\frac{1}{2}$ inches; texture slightly coarse and fibrous, firm, moderately juicy; sweet, rather highly flavored and pleasantly aromatic; quality good. Cavity moderately small, $3 \times 2\frac{1}{2}$ inches, circular in cross-section. Rind thick, $\frac{1}{4}$ inch, very definite, dark green, strong and moderately tough.

Hoodoo. Refs. 15, 36, 58, 105, 110, 119, 136, 141.

Syns. Oblong Hoo Doo, Ordway Queen.

Paul Rose of South Frankfort, Michigan, who in 1898 introduced the Paul Rose variety, continued his selection work and in 1907 sold to D. M. Ferry seed of a new variety which Ferry introduced in 1908 as Hoodoo. This variety soon took the place of the Paul Rose and increased the popularity of this type of melon over those of the larger fruited Osage group.

Hummer.

This melon, similar in type to Hale's Best, was introduced in 1928 by Kilgore Seed Co., Plant City, Florida. It is a midseason variety maturing 4-5 days earlier than Hale's Best, in season with Burrell's Gem, and 6-8 days later than Delicious. The fruits are most like those of Hale's Best but are larger and more oblong in shape. They are as large as Burrell's Gem but lack the smooth furrows of that variety and are not inclined to be as fusiform in shape.

Fruit medium large, $7-8 \times 5-5\frac{1}{2}$ inches; weight $2\frac{1}{2}$ -3 pounds. Shape oval, rounded at base and apex; blossom scar obscure; ribs obscure; furrows occasionally present, very narrow, very shallow

and completely netted. Netting very abundant, finely interlaced; cork moderately heavy, distributed evenly over the surface; interstices medium deep. Skin color green. Flesh orange, medium thick, $1\frac{3}{8}$ - $1\frac{1}{2}$ inches; texture slightly coarse, slightly fibrous, moderately firm and moderately juicy; sweet, somewhat sprightly, highly flavored and pleasantly aromatic; quality good. Cavity moderately small, $3\frac{3}{4} \times 1\frac{3}{4}$ inches; triangular in cross-section. Rind moderately thin, $\frac{1}{8}$ inch, strong and tough.

Ideal. Refs. 101, 133. Syn. Buckbee's Ideal.

This was a variety cataloged by The Vaughan Seed Store of Chicago in 1900 and by H. W. Buckbee of Rockford, Illinois, in 1902. It was a rather large melon, in shape somewhat like Hackensack but with rich salmon flesh.

Another variety bearing this name was listed in 1913 by Geo. Tait & Sons of Norfolk, Virginia. The original catalog descriptions of this and the Ideal of Vaughan are quite similar and it is possible that they originated from the same source. Tait continues to list Ideal as a popular sort. The description below is of melons grown from seed supplied by Buckbee.

Fruit moderately small, $7-7\frac{1}{2} \times 4\frac{3}{4}$ -5 inches; weight $2\frac{1}{2}$ -3 pounds. Shape oval, occasionally somewhat fusiform, base rounded and full, often somewhat tapered, apex even to slightly raised; blossom scar obscure; ribs slightly prominent, $1\frac{1}{2}$ inches broad at the medial; furrows medium broad, moderately shallow and very sparsely and lightly netted, occasionally smooth. Netting moderately abundant, rather coarsely interlaced, often streaked; cork medium heavy, often flattened, distributed rather uniformly over the ribs, base and apex, occasionally somewhat patchy; interstices medium deep. Skin color dull green, later becoming profusely blotched with dark burnt orange. Flesh orange, medium thick, $1\frac{1}{4}$ inches; texture coarse and fibrous, rather firm and moderately juicy; very sweet, somewhat sprightly, rather highly flavored and mildly aromatic; quality good. Cavity medium large, $4 \times 2\frac{1}{2}$ inches, circular in cross-section. Rind moderately thick, $\frac{1}{4}$ inch, medium strong and moderately tough.

Imperial Sunset.

This is a new melon of the Honey Ball type which, because of the salmon pink flesh, gives promise of becoming a successful variety for the market. Prof. J. B. Norton representing the United States Department of Agriculture made the original selection in 1928 in the Imperial Valley, California. Garwood & Woodside, Rocky Ford, Colorado, offered seed in 1934. Unlike many melons of its type, it should be picked on the slip. The vines make a vigorous growth and remain green over a long season, ripening fruits soon after Weaver's Special.

Ironclad. Refs. 29, 53, 98, 99, 100, 133, 140.

The Ironclad melon was introduced in 1896 by Vaughan's Seed Store of Chicago. The originators, C. P. Coy & Sons of Waterloo, Nebraska, considered it worthy of introduction because of its promise as a long distance shipping melon. The illustration in the Vaughan catalog shows it to be an oval-shaped melon with heavy coarse netting. Mr. Coy believed that he had secured a type with thick, leathery, shell-like skin. It was a second early sort with flesh thick, deep yellow and very sweet. The variety was not listed after 1903.

Irondequoit. Refs. 6, 15, 29, 37, 53, 54, 58, 64, 75, 95, 96, 97, 98, 99, 100, 101, 103, 104, 105, 109, 110, 112, 115, 121, 123, 128, 129, 133, 140, 141, 144. Syns. Famous Indiana, Improved Tip Top, Indiana, Indianapolis Market, Netted Tip Top, New Tip Top, New Tip Top Nutmeg, "Tip Top."

The Irondequoit melon was for many years the leading variety grown in Western New York and was first offered in the 1889 catalog of James Vick, seedsman, Rochester, New York. The melon had its origin in the field of a prominent gardener at Irondequoit, who brought his melons to the Rochester market. They were observed by Mr. Vick who secured seed and after testing for a few years deemed it worthy of introduction. Some consider it an enlarged Miller's Cream, but it seems more nearly like the melons in the Surprise group.

This is a midseason variety maturing 4-6 days earlier than Hale's Best, in season with Bender's Surprise, and about a week later than Delicious. It most resembles Bender's Surprise but differs from that variety in being more globular in shape, in having lighter and more finely interlaced netting, paler yellow skin color, much smaller blossom scar, a greater susceptibility to cracking and consequently poorer keeping qualities.

Plant vigorous; vines moderately coarse and heavy, branches many.

Fruit moderately large, $6\frac{1}{2}$ -7 x $6\frac{1}{2}$ inches, often larger, weight 5-6 pounds, often more. Shape globular; base full, slightly flattened; apex even, somewhat susceptible to cracking, blossom scar small, not very conspicuous; ribs moderately prominent, $1\frac{3}{4}$ -2 inches broad at the medial; furrows medium deep, medium broad and smooth. Netting moderately abundant, rather finely interlaced; cork medium light, distributed rather uniformly over the ribs; interstices shallow. Skin color pale yellowish cream. Flesh orange, moderately thick, $1\frac{1}{2}$ - $1\frac{3}{4}$ inches; texture rather coarse and slightly fibrous, soft and juicy; sweet and fair flavor, pleasantly aromatic; quality very good. Cavity moderately large, 3 x $3\frac{1}{2}$ inches, circular in cross-section. Rind thick, $\frac{1}{4}$ inch, rather weak and moderately tender.

Jenny Lind. Refs. 3, 4, 6, 7, 10, 15, 22, 23, 25, 26, 29, 39, 44, 45, 46, 47, 49, 53, 58, 63, 75, 83, 89, 90, 91, 95, 96, 98, 99, 100, 101, 103, 104, 105, 106, 107, 109, 110, 125, 127, 128, 129, 133, 136, 140, 144, 146. Syns. Dreamwold, Dwarf, Earliest Ripe, Early Honeysweet, Early Jenny, Early Jenny Lind, Eighty-eight, Extra Early Jenny Lind, Extra Early Prize Jenny Lind, Extra Early Wonder, Flat Jenny Lind, Improved Early Jenny Lind, Improved Jenny, Improved Jenny Lind, Improved Shipper's Delight, Jenny, Jenny Lind Citron, Jersey Belle, Jersey Button, Large Jenny Lind, Norfolk Button, Prize Jenny Lind, Roberts, Round Jenny Lind, Shipper's Delight, Shipper's Pride, Small Jenny Lind, True Jenny Lind.

According to Dr. Robert P. Harris of Philadelphia, "The Center melon known on the markets of Philadelphia previous to 1840 was supposedly the progenitor of the Jenny Lind named about 1846." The original stock of the variety is thought to have come from Armenia where green-fleshed sorts of this type are common. For fifty years Jenny Lind was one of the leading early green-

fleshed melons suitable for the home garden and for the nearby market. There was the same progressive change in type of the Jenny Lind as we find later in the commercially important shipping melons grown in the west. There were many named selections from this variety, one of the most important being Shipper's Delight introduced in 1897 by Johnson & Stokes. One characteristic of the fruit was the striking appearance of the blossom end which in some selections appeared as a small knob. Norfolk Button and Jersey Button were sub-varieties exemplifying this character.

This is an early variety maturing 4-6 days earlier than Delicious, in season with Early Prolific Nutmeg and about a week later than Early Green Citron. The variety is similar in shape to Fordhook, and is much more oblate than Early Green Citron and Early Prolific Nutmeg. The netting and degree of ribbing is much like that of Early Green Citron while the flesh is brighter green and contains much less yellow.

Plant moderately weak; vines slender; branches medium in number.

Fruit small, $4\frac{1}{2}$ x 5-6 inches; weight $1\frac{1}{4}$ - $1\frac{3}{4}$ pounds. Shape oblate, base and apex flattened and full; blossom scar conspicuous, often with rather prominent navel; ribs slightly prominent, $1\frac{1}{4}$ inches broad at the medial, furrows moderately narrow, rather shallow and smooth. Netting moderately sparse, rather coarsely interlaced; cork medium light, unevenly distributed over the ribs; interstices medium deep. Skin color dull brownish orange, profusely mottled with green. Flesh light green, moderately thin, $\frac{3}{4}$ -1 inch; texture slightly coarse and fibrous, soft and juicy; sweet, mildly flavored and lacking in aroma; quality fair to moderately good. Cavity small, $2\frac{1}{4}$ x $2\frac{1}{2}$ inches, circular in cross-section. Rind thin, $\frac{1}{8}$ inch, weak and tender.

Kinsman Queen. Refs. 29, 53, 97, 99, 100, 133, 136, 140.

The Joseph Harris Company, Moreton Farm, Coldwater, New York, introduced this variety in 1898 as a new melon of considerable merit coming from a cross between Emerald Gem and another variety of large size. According to the catalog of L. Templin & Sons, Calla, Ohio, it was originated by F. Banning of Kinsman, Ohio. By some it was called a yellow fleshed White Japan. An excellent illustration in the 1898 Harris catalog shows the fruits rather deeply ribbed and flattened at both ends.

This was a moderately late variety maturing about a week after Surprise and 4-6 days earlier than Giant. It resembled Giant more than any other sort, although many fruits were as irregularly ribbed as Surprise. It was considerably smaller than Giant and had a darker gray-green skin color. The flesh was more yellow than that of Surprise but much the same in texture.

Fruit medium large, $5\frac{1}{2}$ -6 x $6\frac{1}{2}$ -7 inches; weight 3- $3\frac{1}{2}$ pounds. Shape somewhat oblate, flattened at the ends, blossom scar large and conspicuous; ribs prominent, irregular in size; furrows broad, usually rather deep, smooth. Netting practically absent, occasionally slightly streaked in patches; cork very light and very unevenly distributed. Skin color grayish green, becoming deep yellowish cream at full maturity. Flesh deep yellow, medium thick, $1\frac{1}{4}$ - $1\frac{1}{2}$ inches; texture medium fine, very slightly fibrous, soft and juicy; sweet, fair flavor and mildly aromatic; quality good. Cavity medium large, $2\frac{1}{2}$ -3 x $3\frac{1}{2}$ inches, circular in cross-section. Rind medium thick, $\frac{1}{4}$ inch, rather soft and tender.

Knight. Refs. 15, 27, 58, 64, 68, 79, 105, 109, 136.

Syns. Early Knight, Early Sweet Air, Extra Early Knight, Maryland, New Arundel, New Extra Early Knight, New Knight Cantaloupe, New Maryland, Rival, Sugar Sweet, Sweet Air, Victor.

The Knight melon has, since its introduction in 1908 by Geo. Tait & Sons, Norfolk, Virginia, held its place in that section as the earliest commercial green fleshed variety. Abe Knight of Pasadena, Anne Arundel County, Maryland, originated the variety, possibly as a large fruited selection from Netted Gem with which it is compared in early catalogs. Walter P. Stokes listed it in 1909 as Sugar Sweet but the name Knight has continued as the more popular. A striking characteristic of the fruits is their rather uniform tendency to taper somewhat at the stem end. In quality the fruits have a sweetness and aroma which is quite distinct.

It is a moderately early variety, maturing 4-6 days earlier than Acme, in season with Bottomly and Netted Gem, and 4-6 days later than Jenny Lind. It is very similar to Bottomly in shape and differs from that variety in being slightly smaller, not as heavily netted, and in having a green flesh tinted with orange at the cavity. It is more tapered at the base than Netted Gem and is more coarsely netted.

Plant medium in vigor; vines medium slender; branches few.

Fruit moderately small, $5\frac{1}{2}$ -6 x 4-4 $\frac{1}{2}$ inches; weight 1 $\frac{1}{2}$ -2 pounds. Shape oval, base extended or tapering and apex gently rounded; blossom scar obscure; ribs moderately prominent, 1 $\frac{1}{2}$ -1 $\frac{3}{4}$ inches broad at the medial; furrows medium broad, moderately shallow and smooth. Netting moderately abundant, medium finely laced; cork moderately heavy, distributed uniformly over the ribs and base; interstices moderately deep. Skin color dark green, sparsely mottled with golden yellow at full maturity. Flesh light green blending into a salmon pink adjacent to the cavity, moderately thin, 1-1 $\frac{1}{4}$ inches; texture slightly coarse and fibrous, medium soft and moderately juicy; very sweet, somewhat sprightly, rather highly flavored, pleasantly aromatic; quality good. Cavity moderately small, 3 $\frac{1}{4}$ x 2 inches, triangular in cross-section. Rind moderately thin, $\frac{1}{8}$ inch, medium strong and rather tough.

Lake Champlain. Refs. 54, 105. Syn. Chipman's Lake Champlain.

H. J. Walrath of Conneaut, Ohio, who has become well known as a melon grower and seedsman, was the originator of this variety. Situated in a section where earliness was of the greatest importance, Mr. Walrath experimented with several varieties and finally chose for his main plantings the Paul Rose and Early Ripe, a strain of Early Green Nutmeg. This gave him a variety with orange flesh and one with green flesh. One season he noticed a plant in the Early Ripe rows that produced golden yellow-fleshed fruits. These were saved and seed planted the next year. After several years selection a fixed type was secured. Some of the seed was sent to a relative at Crown Point on Lake Champlain, New York. The result there corroborated the earliness of the new variety which made it outstanding in Ohio. In 1919 S. M. Isbell & Co., Jackson, Michigan, introduced Lake Champlain, "a new muskmelon that commands the market."

This variety with Golden Champlain is considered the earliest commercial sort in many sections. Chip-

man's Lake Champlain named for the late George F. Chipman, editor of Country Guide, Winnipeg, Canada, has proved of value in the Northern Plains area. This strain is offered by Oscar H. Will & Co., Bismarck, North Dakota.

Lewis Perfection. Ref. 106. Syn. Lewis Good Traveler.

Lewis Perfection originated with Mr. Lewis of Pontiac, Michigan, and was introduced in 1906 by J. J. H. Gregory & Son, Marblehead, Massachusetts. According to the illustration in Gregory's catalog, this melon was quite similar to Hollybrook Luscious. It produced large sized fruits often irregular in shape with thick orange yellow flesh. It was late in season and in some sections failed to ripen fruit.

Livingston's Market. Refs. 9, 22, 29, 92, 96, 97, 98, 99, 100, 125, 133, 136. Syns. Livingston's Market Nutmeg, Market, Market Nutmeg.

This melon was listed and illustrated in 1892 by A. W. Livingston Sons, Columbus, Ohio, and a year later by the Ford Seed Co. of Ravenna, Ohio. It was a large green fleshed melon with close netting and rather shallow ribs. It was possibly a selection from Hackensack, which it closely resembled.

Lone Star. Refs. 53, 98, 99, 100, 133.

This was first advertised in 1896 by Johnson and Stokes, Philadelphia, as a new melon from Texas. Lone Star melons were described as free from ribs, finely netted, and having unusually thick, salmon colored flesh. It was listed for about ten years by this company.

Long Island Beauty. Refs. 4, 7, 10, 29, 40, 53, 58, 64, 73, 89, 95, 97, 98, 99, 100, 101, 105, 109, 112, 127, 128, 133, 136, 140. Syn. Island Beauty.

This melon, introduced in 1892 by J. M. Thorburn & Co. of New York, was a selection from Hackensack and originated on Long Island. Like most selections and new sorts it was put forth as superior to its precursor in earliness and in having somewhat heavier netting.

This is a midseason variety maturing 10 days to two weeks earlier than Montreal Market, in season with Hackensack and 3-4 days later than Acme. It is similar in shape to Montreal Market and differs from that variety in being considerably smaller, slightly less netted and lighter green in skin color. It is more globular than Hackensack and has a more yellowish green flesh.

Plant vigorous; vines moderately coarse and heavy; branches medium in number.

Fruit medium large, $5\frac{1}{2}$ -6 x 7-7 $\frac{1}{2}$ inches; weight 4-4 $\frac{1}{2}$ pounds. Shape deep oblate, slightly depressed at the base, even at the apex; blossom scar conspicuous; ribs prominent, 2-2 $\frac{1}{4}$ inches, broad at the medial; furrows broad, deep and smooth. Netting abundant, coarsely interlaced; cork heavy, distributed uniformly over base, apex and ribs; interstices moderately deep. Skin color light green, moderately mottled with dull yellow. Flesh light green blending to a pale yellowish white near the cavity; medium thick, 1 $\frac{1}{4}$ -1 $\frac{1}{2}$ inches; texture moderately coarse and fibrous, soft and juicy; moderately sweet, mildly flavored, and mildly aromatic; quality fair. Cavity moderately large, 3 $\frac{1}{4}$ x 3 $\frac{1}{2}$ inches, circular in cross-section. Rind thick, $\frac{1}{4}$ inch, yellowish green, moderately strong and medium tough.



KNIGHT

(Three-fourths natural size)



Long John.

This new melon from Anne Arundel County, Maryland, is similar in type to Acme. The Meyer Seed Co. of Baltimore introduced this variety in 1930.

It is a midseason sort maturing 3-4 days earlier than Hackensack, in season with Acme, and 4-6 days later than Anne Arundel. It most resembles Anne Arundel but is more slender and oval shaped, not as fusiform as that variety. The skin color is also decidedly darker green, much like that of Burrell's Gem at comparable stages of development. The flesh is similar to that of Anne Arundel but has a pink lining to the cavity not present in that variety.

Fruit moderately small, 6-7 x 4-4½ inches; weight 2-2½ pounds. Shape long oval, base and apex slightly tapering, rounded and full at the extreme ends; blossom scar raised and corky, conspicuous; ribs slightly prominent, 1½ inches broad at the medial; furrows narrow, shallow and netted. Netting abundant, often short streaked, nearly parallel to one another and somewhat dove-tailed at the ends, occasionally finely interlaced; cork moderately heavy, evenly distributed over the surface; interstices moderately deep. Skin color dark green, later turning to brownish green. Flesh light green, sparsely tinted with pale pink about the cavity, moderately thin, 1-1¼ inches; texture moderately coarse, fibrous, moderately firm and medium juicy; moderately sweet, mildly flavored and faintly aromatic; quality fair to poor. Cavity medium large, 4½ x 2 inches, circular in cross-section. Rind thick, ¼ inch, strong and tough.

Long Yellow. Refs. 4, 11, 20, 25, 26, 29, 44, 45, 46, 49, 51, 53, 70, 86, 95, 96, 98, 99, 100, 102, 127, 133, 138. Syns. A. S. & L. Melon, Arlington Long Yellow, Big Ben, California Cream, Common Muskmelon, Granite State, Improved Yellow Large Muskmelon, Large Round Yellow, Long Orange.

In 1863 Burr described under the name Large-ribbed Netted or Common Muskmelon a variety which undoubtedly later came to be better known as Long Yellow. The names as indicated represented the largest yellow-fleshed melon grown and the type has persisted to the present day. The long oval-shaped melons have never been as popular as the short oval or round types and this has been attributed to the fact that the long oval types are more subject to injury in handling. The variety was undoubtedly used in crossing to bring out newer varieties with orange flesh.

This is a moderately early variety maturing at Geneva about ten days earlier than Bay View, in season with Delicious and Extra Early Osage and about 4-6 days later than Golden Champlain. It is very much like Bay View in shape and skin color. It differs from that variety in flesh color, more granular in flesh character, and in being larger, less netted and less finely interlaced.

Plant vigorous; vines moderately coarse and heavy; branches many.

Fruits very large, 10-12 x 5-6 inches; weight 6-8 pounds. Shape fusiform to long oval, base tapering, apex even, blossom scar obscure; ribs prominent, 2 inches broad at the medial; furrows broad, moderately deep and smooth. Netting moderately sparse, medium finely laced; cork medium long, unevenly distributed over the ribs; interstices shallow. Skin color dull orange yellow sparsely mottled with green. Flesh pale orange yellow, medium thick, 1¼-1½ inches; texture fine; fiberless, moderately firm, rather dry, insipid, poorly flavored and lacking in aroma; quality poor.

Cavity very large, 8 x 3 inches, circular in cross-section. Rind thick, ¼ inch, weak and tender.

Los Angeles Market.

This melon was introduced about 1908 by Aggeler & Musser of Los Angeles. With the exception of Giant it was the largest fruited sort then known.

It was a moderately late variety, maturing between Hackensack and Montreal Market. It was somewhat more globular than Hackensack, equally as well netted, and intermediate in size between that variety and Montreal Market. Also the skin color was more orange and the ribs less prominent.

Fruit moderately large, 7-8 x 6-7 inches, weight 5-6 pounds. Shape nearly globular to slightly oval, symmetrical, base and apex full and broadly rounded; blossom scar obscure; ribs slightly prominent, 1¾-2 inches broad at the medial; furrows broad, shallow and netted. Netting abundant, rather coarsely interlaced; cork heavy and broad, distributed evenly over the surface; interstices moderately deep. Skin color dull burnt orange. Flesh green, moderately thick, 1½-1¾ inches; texture coarse and fibrous, medium soft and juicy; very sweet, highly flavored and distinctly aromatic; quality very good. Cavity large, 4 x 3 inches, circular in cross-section. Rind thick, ¼ inch, strong and tough.

Matchless. Refs. 69, 95, 101, 133, 136, 140. Syn. Early Matchless.

From W. B. Covalt of Kansas, W. Atlee Burpee received a basket of muskmelons, which, although possessing some of the characteristics of the leading melons of that period, were apparently different enough to attract notice. After a year's trial and testing by several noted melon growers, Burpee introduced it in 1901 as Matchless. Matchless remained a popular variety for nearly thirty years.

It is a midseason variety, maturing about 3-4 days earlier than Hackensack, in season with Acme and 3-4 days later than Netted Gem. It is larger than Netted Gem but otherwise is similar to it in shape, character of netting, and flesh color.

Fruit moderately small, 6½-7 x 4½-5 inches; weight 2½-3 pounds. Shape moderately long, plump, oval, base and apex gently rounded; blossom scar obscure; ribs slightly prominent, 1½ inches broad at the medial; furrows narrow, very shallow and usually smooth. Netting abundant, medium finely interlaced; cork medium heavy, distributed uniformly over the ribs, base and apex; interstices medium deep. Skin color dark bronze green. Flesh light green, moderately thin, 1-1¼ inches; texture medium coarse and rather fibrous, soft and juicy; very sweet, somewhat sprightly, rather highly flavored and pleasantly aromatic; quality good. Cavity moderately small, 3½-4 x 1¾-2 inches, circular in cross-section. Rind thick, ¼ inch, medium strong and moderately tough.

McCotter's Pride. Refs. 98, 99, 100, 101, 133, 136.

This name was given to a variety introduced in 1897 by D. M. Ferry & Co., Detroit, Michigan, and listed by them until 1912. Although rather late in season, it was a variety intended to fill the need for a large melon, spherical in shape, with orange flesh, and of high quality. It was very similar to Buckbee's Ideal.

McDaniels Nugget. Ref. 81. Syns. Arizona Nugget, Yuma Nugget.

E. M. McDaniel of Yuma, Arizona, selected this melon from a strain of Perfecto cantaloupes. It was

first known commercially in 1933 as McDaniel's Nugget and as such was sent out for trial by the Ferry-Morse Seed Co. Since that time it has become better known as Arizona Nugget and as such is cataloged by the Woodside Seed Growers Co. of Rocky Ford, Colorado. The fruits are smaller than those of Perfecto, are heavily netted, slightly ribbed, and have flesh which is a deep salmon in color.

Melodew. Syns. Golden Melodew, Honeymel, Honey Net, Masterpiece.

This new melon was discovered by J. E. Gauger of Swink, Colorado, who had named and introduced the Honey Dew many years ago. Melodew was first introduced in 1913 by the Melodew Company, Rocky Ford. Walter Higbee and Jerre Cover took a leading part in the selection work. It has been successfully grown in Northern districts where the season is too short for Honey Dew.

It is a moderately late melon at Geneva, having reached maturity 4 or 5 days earlier than Weaver Special in season with Abbott's Pearl and Golden Combination and about a week or 10 days later than Sugar Rock. In exterior appearance the fruits most resemble Weaver Special and Honeyball, although they are usually somewhat more oval than these varieties and less uniformly netted than those of the former. It is similar in shape to Hale's Best, but is decidedly less netted and distinctly more creamy yellow in skin color.

Plant moderately vigorous; vines coarse and moderately heavy; branches moderately few.

Fruit moderately small, $5-5\frac{1}{2} \times 4\frac{1}{2}-5$ inches; weight 2-2½ pounds. Shape short oval, base and apex rounded and full, blossom scar inconspicuous; ribs obscure, medium broad, $1\frac{1}{4}$ inches at the medial; furrows very shallow, narrow and sparsely netted. Netting moderately abundant, rather coarsely interlaced, often somewhat streaked; cork medium light, distributed uniformly over the entire fruit; interstices moderately shallow; skin color pale creamy yellow with a greenish tint. Flesh light green, medium thick, $1\frac{1}{4}-1\frac{1}{2}$ inches; texture coarse, slightly fibrous, very firm, moderately juicy; sweet, somewhat sprightly, rather highly flavored and mildly aromatic; quality good. Cavity small, $2\frac{3}{4} \times 1\frac{1}{2}$ inches, triangular in cross-section. Rind medium thick, $\frac{1}{8}-\frac{1}{4}$ inch, light green, strong and tough.

Melrose. Refs. 7, 11, 29, 53, 69, 96, 97, 98, 99, 101, 107, 112, 114, 128, 133, 136, 140. Syn. New Melrose.

This variety came from a Mr. Paynter Frame of Delaware as a chance seedling in a mixed planting grown in 1885. Mr. Frame while going over the field late in the season noticed a few melons that were edible after the others were gone. Seed from these fruits gave some rather promising plants and after several years selection, a type which was fixed and pure was secured. Seeds were offered in packets by W. Atlee Burpee in 1893, and for many years the variety was quite popular.

This was a moderately late variety maturing a few days earlier than Texas Cannon Ball and in season with Nixon. It was slightly more oval than Texas Cannon Ball, but very similar to that variety in character of netting and skin color. The flesh was usually more often tinted with pink about the cavity.

Fruit moderately small, $5\frac{1}{2}-6 \times 5-5\frac{1}{2}$ inches; weight $2\frac{1}{4}-2\frac{1}{2}$ pounds. Shape short oval to nearly globular, base rounded to very slightly extended, apex rounded; blossom scar obscure; ribs and furrows obscure. Netting moderately abundant, very largely streaked, slightly cross netted, somewhat circular at base and apex; net medium light, distributed moderately uniform over the surface; interstices medium shallow. Skin color dull bronze green mottled with dull orange brown at full maturity. Flesh green with a narrow pink area about the cavity, thin, $\frac{7}{8}-1$ inch; texture coarse and fibrous, medium firm and medium juicy; sweet, fair flavor and mildly aromatic; quality fair to good. Cavity moderately small, $3 \times 2\frac{1}{2}$ inches, circular in cross-section. Rind medium thick, $\frac{1}{8}$ inch, moderately strong and tough.

Miller's Cream. Refs. 46, 84, 118. Syns. Miller's Cream Nutmeg, Miller's Cream Osage, Miller's Hybrid, New Princess.

When the number of good varieties was much smaller than it is today it was the policy of many leading gardeners to test out all the promising novelties as offered. John D. Miller of Elmira, New York, in pursuance of this policy grew among other varieties Casaba, Sill's Hybrid and Green Nutmeg muskmelons. In 1877 a different appearing melon was noticed in the field planted with seed of his own saving. The progeny of this apparent hybrid differed widely in shape, size, skin color and form but after a period of selection a rather long type with green skin and deep orange flesh of the highest quality was developed. Seed of this was first distributed in 1885 by J. J. H. Gregory of Marblehead, Massachusetts, under the name Miller's Cream. In describing this melon in 1886 Goff wrote: "This delicious melon is distinct from any I have thus far described. I think it is the first oval, orange fleshed melon I have met." The new melon soon became very popular and was a leading variety in nearly all muskmelon growing districts. From seed as originally sent out there occasionally appeared mixed types. Continued selection on these resulted in a fairly stable sort but today there is no recognized type for Miller's Cream. Osage and Miller's Cream from the time of their separate introduction have been confused and it is little wonder that today they are considered as identical.

Millionaire.

This is a melon probably grown only in California. It was introduced there about 1918 by Chas. C. Navlet Co., San Jose, California.

This was a moderately early variety, maturing 6-8 days earlier than Bender's Surprise, in season with Delicious, and 4-6 days later than Golden Champlain. It was similar in shape, character of netting and skin color to that of Golden Combination. It differed from that variety in being smaller and in having a distinctly pale, more cream-colored flesh.

Fruit moderately large, $6\frac{1}{2}-7 \times 7-7\frac{1}{2}$ inches; weight 5-6 pounds. Shape globular, slightly flattened at the base, apex even, slightly susceptible to cracking; blossom scar rather conspicuous; ribs slightly prominent, 2 inches broad at the medial; furrows broad, shallow and smooth. Netting moderately abundant, rather coarsely interlaced, often streaked and circular in pattern at the base; cork medium heavy, distributed moderately uniform over the ribs, base and apex; interstices medium deep. Skin color pale grayish green later turning to creamy yellow. Flesh pale yellowish cream, thick,

1½-2 inches; texture coarse and fibrous, medium soft and juicy; sweet, medium flavor, mildly aromatic; quality good. Cavity medium large, 3 x 3 inches, circular in cross-section. Rind thick, ¼ inch, medium strong and slightly tough.

Milwaukee Market. Refs. 15, 37, 54, 65, 68, 75, 105, 109, 121, 123, 133, 136, 143. Syns. Big Profit, Honey Sweet, Improved Milwaukee Market, Pfister, Thomas Hybrid, Utter.

This melon is considered by many growers in the north central states area to be the best melon in its class. It was offered sometime previous to 1906 by Currie Brothers of Milwaukee and by Vaughan's Seed Co. in 1907. Its origination is credited to a cross between Surprise and a Gem melon made by a grower near Burlington, Wisconsin. At the time of its introduction there were several strains or selections in the hands of growers, of which the Utter and Pfister strains were acknowledged as superior. The name Milwaukee was popular, however, and as such it is well known today.

It is a midseason variety, maturing 2 or 3 days earlier than Bender's Surprise, in season with Honey Rock, and 4-6 days later than Delicious. It is very similar to Bender's Surprise but will average smaller, and is more symmetrical, less deeply furrowed, somewhat more profusely netted and finely interlaced, has a smaller blossom scar and is more susceptible to splitting at that end. It is believed to be the best in quality of the group, but its relatively poor keeping quality has limited its use in this section.

Plant vigorous; vines medium heavy; branches many.

Fruit moderately large, 7½-8 x 7-7½ inches; weight 5½-6 pounds. Shape nearly globular, slightly flattened at the base, rounded at the apex; blossom scar small, moderately corky; ribs moderately prominent, 1½-2 inches broad at the medial; furrows medium broad, rather shallow and netted. Netting abundant, usually finely interlaced, often rather coarse; cork medium heavy, rather broad, distributed unevenly over the fruit; interstices shallow. Skin color pale creamy yellow. Flesh orange, moderately thick, 1½-1¾ inches; texture moderately coarse and fibrous, soft and juicy; sweet, rather highly flavored and mildly aromatic; quality good. Cavity large, 4 x 3 inches. Rind medium thick, ⅛ inch, rather weak and moderately tender.

Missouri. Refs. 26, 53, 98, 99, 100, 101, 133, 140. Syn. Missouri Nutmeg.

This was a melon offered in 1892 by D. Landreth & Sons, Philadelphia. A cut shows the fruits quite like those of Hackensack, with heavy netting and deep ribbing. It was a green fleshed sort.

Montreal Market. Refs. 4, 7, 14, 15, 23, 25, 28, 29, 35, 39, 41, 44, 45, 46, 49, 50, 51, 53, 64, 69, 70, 71, 73, 83, 84, 88, 89, 90, 91, 92, 93, 96, 97, 98, 99, 100, 101, 102, 105, 106, 107, 108, 109, 110, 125, 126, 127, 129, 133, 135, 136, 140, 142, 143, 144, 146. Syns. Canadian, Canadian Market, Giant Montreal, Giant Montreal Market, Green Montreal, Improved Montreal Green Nutmeg, Improved Montreal Market, Large Montreal Market, Large Sweet Nutmeg, Mammoth Montreal, Mammoth Montreal Nutmeg, Montreal, Montreal Beauty, Montreal Green, Montreal Green Nutmeg, Montreal Improved Nutmeg,

Montreal Large Green Nutmeg, Montreal Market Nutmeg, Montreal Nutmeg, Perfection Montreal, Perfection Montreal Nutmeg, St. Louis Market, Washington Market.

The Montreal Market melon handled skillfully and intelligently produces the largest fruits of its type in American cultivation. W. Atlee Burpee on a trip to Montreal in August of 1880 saw some fruits on the St. Ann's market. A fruit weighing over sixteen pounds was photographed and used to illustrate the variety when Burpee introduced it in 1881. The story of the success of this melon is as much a record of continued selection for type as it is of extreme care in its cultivation. Numerous strains have been and are in existence and the original type remains in use today. For many years the better known eating places in New York City received melons daily from Canada to serve to their most fastidious customers. Better varieties in this country, a decline in demand for green fleshed sorts, and the waning "particular customer" trade has practically eliminated these shipments.

This is a late variety at Geneva, maturing about a week later than Bender's Surprise and Hackensack, in season with Chicago Market, and about two to three weeks later than Early Green Nutmeg. The fruits are somewhat like Hackensack, differing from that variety in being much less oblate, considerably larger and heavier, usually more uniformly netted and more uniformly green in flesh color. It is somewhat similar to Chicago Market, considerably larger, and more uniformly and heavily netted.

Plant very vigorous; vines coarse and heavy; branches many.

Fruit very large, 8-9 x 9-10 inches; weight 9-10 pounds, occasionally more. Shape nearly globular, slightly flattened at base and apex; blossom scar moderately conspicuous; ribs prominent, 2-2½ inches broad at the medial; furrows narrow, deep and usually netted; occasionally smooth. Netting abundant, moderately fine interlaced; cork heavy, uniformly distributed over entire fruit; interstices moderately deep. Skin color green, irregularly mottled with greenish yellow. Flesh light green; medium thick, 1¼-1½ inches; texture coarse, fibrous, moderately soft and juicy; sweet, mildly flavored, mildly aromatic; quality fair to good. Cavity very large, 4 x 4, circular in cross-section. Rind thick, ¼ inch, moderately tough and strong.

Netted Beauty. Refs. 9, 53, 63, 98, 99, 100, 127, 133, 140.

This melon was named and introduced in 1893 by Johnson & Stokes, Philadelphia. In season it was reputedly a few days later than Extra Early Prize and Jersey Bell. The melons, however, were more oval shaped, and had a more highly flavored pale green flesh.

Netted Gem. Refs. 7, 14, 15, 23, 25, 26, 28, 29, 39, 41, 45, 46, 47, 49, 51, 52, 53, 58, 61, 62, 63, 70, 73, 84, 85, 88, 89, 90, 91, 92, 93, 95, 96, 97, 98, 99, 100, 101, 102, 105, 106, 107, 108, 109, 115, 121, 124, 125, 127, 129, 132, 133, 136, 137, 140, 142, 143, 144. Syns. Alamo Nutmeg, Bate's Gem, Dewey Gem Nutmeg, Disco Gem, Early Golden Netted Gem, Early Model, Early Netted Gem, Extra Early Netted Gem, Extra Early Round Netted Gem, Gem, Genesee Golden Gem, Golden Gem, Golden

Jenny, Golden Jersey, Golden Netted, Golden Netted Gem, Green Fleshed Genesee, Green Netted, Improved Netted Gem, Johnson's Ring Leader, Little Gem, Model, New Early Victor, New Gem, New Mellobite, Oblong Netted Gem, O. K. Netted Gem, Oval Gem, Oval Netted Gem, Perfection Gem, Rose Gem, Round Gem, Round Netted Gem, Silver Netted Gem, Unequaled Gem.

Burpee's Netted Gem introduced by W. Atlee Burpee in 1881 was the progenitor of the Rocky Ford melon. Developed from a chance cross of Nutmeg with some variety with larger and more oval fruits, Netted Gem became the accepted melon for shipping in all the eastern districts. Because of its possibilities as a shipping melon and its adaptation to growing conditions as found in Colorado, it ranked as the most important introduction of its time. From this one melon has come a multitude of strains and selections which have gradually resolved themselves into the almost perfect shipping melons of today.

The original Netted Gem is no longer listed by American seedsmen. It has been the basis for a great many selections for the development of shipping melons. Netted Gem was a moderately early melon maturing about the same season as Knight and Bottomly and 8-10 days earlier than Rocky Ford and Pollock 10-25. In shape it was more oval than Rocky Ford, distinctly more ribbed and much less netted along the furrows, often nearly smooth in this respect.

Plant moderately vigorous; vines medium slender; branches many.

Fruit small, 5-5½ x 4-4½ inches; weight 1½-2 pounds. Shape short oval, symmetrical and rounded at base and apex; blossom scar obscure; ribs moderately prominent, 1¼ inches broad at the medial; furrows narrow, shallow and distinctly smooth. Netting abundant, moderately coarse laced; cork moderately heavy and distributed uniformly over the ribs, base and apex; interstices medium deep. Skin color dark green turning dark bronze yellow at full maturity. Flesh light green blending rather abruptly to delicate pink about the cavity; moderately thin, 1½-1¾ inches; texture medium fine, rather fibrous, firm, juicy; sweet, sprightly flavored and mildly aromatic; quality good. Cavity small, 2¾ x 2 inches, circular in cross-section. Rind medium thick, ⅛ inch, strong and moderately tough.

New Orleans Market. Refs. 22, 41, 53, 63, 91, 96, 97, 101, 127, 128, 133, 140. Syns. Creole, Creole Prize, New Orleans.

This is an old variety which is well-known in the South, particularly in the New Orleans market. It is listed and illustrated in the 1930 catalog of Reuter Seed Co., New Orleans. It was cataloged by A. W. Livingston in 1892 and in 1895 by the Richard Frotscher Seed Co.

This apparently was much like Champion Market in shape and size, often being a little larger. It differed chiefly from that variety in having heavier and decidedly more coarsely interlaced netting and a much less prominent blossom end scar. It also had a thinner rind and, obviously, was a poorer handler and keeper.

Fruit medium large, 6-6½ x 7-7½ inches; weight 4-4½ pounds. Shape nearly globular, slightly flattened at the base, and

apex full; blossom scar obscure; ribs prominent, 1½-2 inches broad at the medial; furrows broad, medium deep and smooth. Netting moderately abundant, coarsely interlaced; cork heavy and unevenly distributed over the surface, often patchy; interstices medium deep. Skin color greenish yellow, sparsely mottled with cream. Flesh light green, moderately thin, 1⅝-1¾ inches; texture coarse and fibrous, soft and juicy; sweet, fair flavor and mildly aromatic; quality fair to moderately good. Cavity medium large, 3 x 3 inches, circular in cross-section. Rind thick, ¼ inch, rather soft and weak.

Newport. Refs. 9, 29, 38, 53, 97, 98, 99, 100, 101, 133.

Peter Henderson & Co. of New York offered this melon in 1892 saying that in general appearance it did not differ from the Hackensack except that it was a little smaller. It was apparently well liked by those who considered quality before yield and size.

Nixon. Refs. 89, 91, 92, 97, 125, 133.

Before the development of the melon industry in Colorado and the West, the South was the leading melon shipping section of the country. Major John W. Nixon of Augusta, Georgia, was one of the pioneer growers and was known far and wide for his barrel shipments of the Nixon melon. The variety originated near Augusta and was advertised as a real "Georgia cantaloup" or "purely a southern melon." The age of the variety is not known but records of its use go back to 1876.

This is a moderately late variety, maturing 4 or 5 days earlier than Texas Cannonball, in season with Honey Mel and Rocky Ford, and 6 or 8 days later than Honey Rock. The fruits most resemble Texas Cannon Ball in shape, but are slightly smaller, more uniformly netted and slightly more furrowed. The skin has more brown pigments and the flesh is softer and tinted with orange about the cavity instead of solid green as with Texas Cannon Ball.

Plant vigorous; vines coarse and heavy; branches medium in number.

Fruit medium large, 5½-6 x 5½-6 inches; weight 2¾-3¼ pounds. Shape globular, symmetrical; base slightly depressed; apex full, blossom scar obscure; ribs slightly prominent, 1¾ inches broad at the medial; furrows moderately narrow, shallow and usually smooth to slightly netted. Netting moderately abundant, rather coarsely laced, often streaked; cork medium heavy, distributed rather uniformly over the entire surface; interstices moderately shallow. Skin color golden brown profusely mottled with green. Flesh light green with thin pale orange area adjacent to cavity; moderately thick, 1½-1¾ inches; texture moderately coarse, fibrous, medium firm and juicy; very sweet, strongly flavored and rather pungent; quality fair to moderately poor. Cavity moderately small, 2¾ x 2½ inches, circular in cross-section. Rind thick, ¼-⅜ inch, moderately strong and medium tough.

Nutmeg. Refs. 2, 4, 8, 20, 22, 26, 28, 29, 31, 35, 41, 43, 44, 45, 46, 47, 49, 53, 63, 90, 91, 92, 94, 95, 96, 98, 99, 100, 101, 103, 104, 105, 106, 107, 109, 116, 117, 124, 125, 127, 130, 131, 133, 135, 136, 139, 144. Syns. Alton Large Nutmeg, Arlington, Arlington Green Fleshed, Arlington Green Nutmeg, Arlington Nutmeg, Boston Large Nutmeg, Brooks Nutmeg, Early Burlington, Early Green Flesh Nutmeg, Early Green Nutmeg, Early Nutmeg, Early Prolific Nutmeg, Early Ripe, Early Round Nutmeg, Early Sugar Nutmeg, Extra Early Green Nutmeg, Extra Early Nutmeg, Fine Green Nut-

meg, Fine Netted, Fine Netted Nutmeg, Fine Nutmeg, Green-fleshed Nutmeg, Green Meated Nutmeg, Improved Arlington Nutmeg, Improved Citron Nutmeg, Improved Green Nutmeg, Improved Green Prolific Nutmeg, Improved Large Nutmeg, Improved Nutmeg, Improved Prolific Nutmeg, Large Green Nutmeg, Large Nutmeg, Netted Nutmeg, Prolific Green Nutmeg, Prolific Netted, Prolific Netted Nutmeg, Prolific Nutmeg, Small Green Nutmeg, Sugar Nutmeg.

The name "Nutmeg" was given to the variety from its similarity of form to that of a nutmeg. One of the oldest melons known, it for many years represented a rather definite type but after half a century in cultivation certain variations due to natural crossings occurred and today Nutmeg is perhaps more suggestive of a group of melons than it is of any specific melon. Green Nutmeg, Early Green Nutmeg, Alton Nutmeg (introduced in 1865 by O. L. Barler of Alton, Illinois), and Improved Green Nutmeg were among the earliest of these variations but represent only a few of the many names used. It was listed in all of the early catalogs under the brief description, "Nutmeg; green flesh, very sweet and fragrant; early." Burr in 1863 described 12 varieties of melons suitable for the garden, and of those Nutmeg was the only small, oval, early green-fleshed variety. The most typical strain obtainable today is much more oblate than the original, and is described below.

This is an early melon, maturing at Geneva about the same time as Golden Champlain and Jenny Lind, a few days later than Early Green Citron, and about a week or ten days earlier than Hackensack. The fruits are similar in type and shape to Hackensack, being decidedly smaller, less uniformly netted and more coarsely interlaced, with skin of a darker yellowish brown color. It is very similar to Early Green Citron, although it is slightly larger, somewhat more oblate, more profusely netted and lacks the yellowish green flesh color present in that variety.

Plant medium in vigor; vines moderately slender; branches many.

Fruit moderately small, $4\frac{1}{2}$ -5 x $5\frac{1}{2}$ -6 inches; weight $2\frac{1}{2}$ -3 pounds. Shape oblate; base slightly depressed; apex even; blossom scar conspicuous, corky; ribs rather obscure, $1\frac{1}{2}$ inches broad at the medial; furrows narrow, shallow and smooth. Netting medium abundant, rather coarsely interlaced; cork medium heavy, rather uniformly distributed over the ribs; interstices medium deep. Skin color dull yellowish brown moderately mottled with green. Flesh light green; moderately thin, $1-1\frac{1}{4}$ inches; texture moderately coarse and fibrous, soft and juicy; very sweet and sprightly, strongly aromatic; quality fair to good. Cavity medium large, 3 x 3 inches, circular in cross-section. Rind thick, $\frac{1}{4}$ inch, rather soft and tender.

Ohio Sugar. Refs. 15, 58, 64, 65, 73, 79, 105, 109, 136.

Syns. Green Fleshed Tip Top, Minnesota Melting Sugar.

The Livingston Seed Co., Columbus, Ohio, introduced this melon in 1908 as the sweetest and richest flavored green-fleshed melon they had ever seen. Coming from a cross made five years earlier, it had all the external appearance of Tip-Top and in a few years became more widely known as "Green Fleshed Tip Top."

Those who knew their melons found that the flesh was a little less fibrous than that of Hackensack with a more pleasing taste, a little sweeter with a less pronounced musk aroma. For nearly thirty years it steadily gained friends, and in some sections is still considered a very desirable type.

It is a moderately late variety, maturing 4-6 days earlier than Montreal Market, in season with Oka and Hale's Best and about a week later than Bender's Surprise. It resembles Bender's Surprise in exterior appearance, being less symmetrical, more unevenly ribbed and often more patchy in netting and skin color. The flesh is more greenish yellow than that of Montreal Market.

Plant vigorous; vines moderately coarse and heavy; branches many.

Fruit very large, 8-9 x 7-8 inches; weight 6-8 pounds; shape short oval to nearly globular; base slightly enlarged and depressed; apex full; blossom scar conspicuous, corky; ribs prominent, $1\frac{3}{4}$ inches broad at the medial; furrows narrow, moderately deep and smooth. Netting moderately sparse, coarsely interlaced, often streaked; cork medium heavy, unevenly distributed over the ribs; interstices medium deep. Skin color creamy yellow. Flesh light green with a pale amber tint near the cavity; texture fine, slightly fibrous, soft and juicy; sweet and rather highly flavored, rather pleasantly aromatic; quality good. Cavity very large, 5 x $3\frac{1}{2}$ inches, circular in cross-section. Rind thick, $\frac{1}{4}$ - $\frac{3}{8}$ inch, medium soft and rather tender.

Oka. Ref. 109.

The Montreal Melon, which for size and quality had few superiors as a green-fleshed sort, was used as one parent to produce the Oka melon. The second parent was the Banana, which, although of too irregular shape for a good market melon, possesses an unusually sweet, deep orange flesh. The cross was made some twenty-five years ago by the Rev. Father Athanase of the Trappist Monastery at La Trappe, Quebec. The melon received the name Oka from the Oka Agricultural Institute and the Oka monastery founded in 1720. Seed in this country was distributed in 1924 by Joseph Breck & Sons of Boston. Father Athanase who passed on some years ago delegated to Dupuy & Ferguson of Montreal the maintenance of his strain.

It is a moderately late variety maturing 6-8 days earlier than Montreal Market, in season with Hale's Best and 4-6 days later than Bender's Surprise. It is similar to Irondequoit in shape and size, although it is somewhat less ribbed, more sparsely netted and has a larger, more prominent blossom scar. It is decidedly less ribbed and netted than Montreal Market and somewhat more regular in shape.

Plant vigorous; vines very coarse and heavy; branches moderately few.

Fruit medium large; $5\frac{1}{2}$ -6 x $6\frac{1}{2}$ -7 inches; weight 5-6 pounds. Shape globular, with base slightly enlarged, apex even; blossom scar conspicuous; ribs slightly prominent, somewhat paired, $1\frac{3}{4}$ -2 inches broad at the medial, not uniform; furrows moderately broad and moderately shallow, alternate ones more shallow, smooth, occasionally slightly netted. Netting rather sparse, medium finely interlaced, often short streaked; cork light, unevenly distributed over the ribs; interstices very shallow. Skin color creamy yellow. Flesh orange yellow, medium thick, $1\frac{1}{4}$ - $1\frac{1}{2}$ inches; texture coarse, fibrous, moderately sweet, mildly flavored and faintly aromatic;

quality fair. Cavity large, $3\frac{1}{2}$ –4 inches, circular in cross-section. Rind very thick, $\frac{3}{8}$ inch, medium strong and fairly tough.

Oregon Delicious. Ref. 54. Syn. Golden Heart.

Gill Bros. Seed Co. of Portland, Oregon, introduced this distinct new melon in 1929. It was a selection from the Speer melon which had been grown for many years by a gardener of that name at Albany, Oregon. When first offered many of the melons were slightly pear-shaped at the stem end but Gill Bros. have partly succeeded in selecting away from this to get a more rounded end. The origin of the Speer melon is unknown but it is suspected by Gill Bros. to have been a hybrid perhaps with the Banana melon as one parent. The variety is used chiefly as a home garden and market sort.

This is a moderately late variety maturing at Geneva 4 or 5 days earlier than Montreal Market, in season with Abbott's Pearl and Rocky Ford and a week or ten days later than Delicious. It most resembles Abbott's Pearl in general shape, but is considerably larger, has somewhat lighter netting which is not as finely interlaced. It also strongly resembles Sugar Rock in some respects, particularly in color of skin and type of netting. It is, however, much more oblong and more distinctly ribbed.

Plant vigorous; vines moderately coarse; branches medium in number.

Fruit moderately large, $8\frac{1}{2}$ –9 x 6 – $6\frac{1}{2}$ inches; weight $4\frac{1}{2}$ –5 pounds. Shape long oval to fusiform, base decidedly extended, often to a snout-like protuberance; apex moderately extended; blossom scar obscure; ribs not prominent, $1\frac{1}{2}$ –2 inches broad at the medial; furrows narrow, very shallow and netted. Netting sparse, very coarsely interlaced, often in the form of long streaks; cork heavy and very broad, distributed rather uniformly over the entire fruit; interstices moderately shallow. Skin color pale grayish green, later turning to creamy yellow. Flesh deep orange, medium thick, $1\frac{1}{4}$ – $1\frac{1}{2}$ inches; texture very fine, fiberless, medium firm, juicy; very sweet, highly flavored and pleasantly aromatic; quality very good. Cavity moderately large, 5 x $2\frac{1}{2}$ inches, triangular in cross-section. Rind thick, $\frac{1}{4}$ inch, strong and moderately tough.

Osage. Refs. 4, 6, 10, 12, 15, 22, 29, 33, 36, 38, 39, 41, 48, 50, 53, 54, 58, 64, 65, 70, 78, 79, 83, 91, 92, 94, 95, 96, 97, 98, 99, 100, 101, 103, 104, 105, 106, 108, 109, 118, 123, 125, 127, 128, 129, 133, 136, 140, 141, 143, 144. Syns. All Meat, Beauty Osage, Connecticut Special, Golden Prince, Golden Wonder, Honey Drop, Honey Drop Improved, Improved Osage, Invincible, "Millers Cream," Netted Osage, New Orange Cream, New Osage, New Osage Gem, Orange Cream, Osage Blue Ribbon, Osage Orange Flesh, Osage Red Flesh, Osage Salmon Fleshed, Osage Select, Premium Osage, Selected A-1, Selected New Osage, Yellow-fleshed Osage.

The Osage melon was probably the first of the many successful plant originations by Roland Morrill of Benton Harbor, Michigan. This is in the oldest commercial peach region in Michigan. After the yellows destroyed the peach industry the district turned to a more diversified horticulture, and planted berries and grapes and finally melons with a miscellaneous list of other vegetables.

In 1871 William Rose and in the following year Mr. Morrill, began to raise melons. A few years later, in the search for better varieties, seeds of a melon grown in the county along the Osage River, in Kansas, were brought to Benton Harbor. This melon, sometimes called Black Swedish, was black-green, with a very thick, sweet, yellow flesh, although it was small and round. About 1882 Miller's Cream, a long smooth variety of good quality was also introduced in the section. A natural cross was facilitated between the two varieties by Mr. Rose and Mr. Morrill by planting the two kinds together. In order to obtain earliness, the improved stock was later crossed with the Christiana, a round netted melon, but having flesh which becomes soft in shipping. The new type was desired, above all, to be solid and durable, to have a thin rind, protected with a moderate netting and to be egg-shaped for ease in handling.

Careful selection by Mr. Morrill of his seed melons each year built up a seed stock which for purity was noted throughout the region. In 1887 Mr. Morrill sold seeds of the new melon to J. C. Vaughan of Chicago, who introduced it under the name Osage. After forty years this melon still holds a firm position among the best American varieties, although it has been abandoned by its originator and by the district in which it grew to fame. This, however, is only because of a new variety developed by Mr. Morrill, the Hearts of Gold melon, which proved even more suited to the region.

It is a midseason variety maturing about 4 or 5 days earlier than Hales Best, in season with Bender's Surprise, and about a week later than Extra Early Osage. It most resembles the latter variety, although Osage is a trifle more ovate in shape and is less netted. It is distinctly more oblong and ovate than Bender's Surprise and is considerably finer interlaced and less netted. The skin color and type of netting is much like that of Emerald Gem. The flesh is much the same as Extra Early Osage in color, but in some sections it is often considered inferior to it in quality.

Plant vigorous; vines heavy and coarse; branches many.

Fruit moderately large, 7–8 x 6 – $6\frac{1}{2}$ inches; weight 5–6 pounds. Shape ovate, base full, somewhat enlarged; apex even; blossom scar small and obscure; ribs slightly prominent, $1\frac{3}{4}$ inches broad at the medial; furrows moderately broad, shallow and smooth. Netting very sparse, patchy, rather coarsely interlaced; cork medium light, unevenly distributed over the ribs and at the base; interstices moderately shallow. Skin color dark green profusely mottled with dull brownish yellow at full maturity. Flesh orange, medium thick, $1\frac{1}{4}$ – $1\frac{3}{8}$ inches; texture fine, slightly fibrous, soft and juicy; moderately sweet, rather mildly flavored and mildly aromatic; quality fair to moderately good. Cavity large, $4\frac{1}{2}$ x $2\frac{3}{4}$ inches, triangular in cross-section. Rind thick, moderately weak, and rather tender.

Page's Early. Ref. 79.

This was introduced in 1918, by Oscar H. Will & Co., Bismarck, North Dakota. That it may have been a hybrid sort is suggested by the warning that there were somewhat varied types in the original stock. Continued selection has perfected a rather pure strain noted for its earliness.

It is an early variety maturing about a week later than Early Bird and Early Green Citron, in season with Golden Champlain, and 4-6 days earlier than Golden Cream and Delicious. In exterior appearance it most resembles Golden Cream, being slightly smaller, less ovate in shape, more orange in skin color and often less netted. It is entirely distinct from Golden Champlain and other early melons in that it has decidedly less netting and a much more pronounced orange yellow skin color. The flesh is much thinner than that of Golden Cream and much poorer in quality.

Plant weak; vines moderately slender, branches few.

Fruit moderately small, $5\frac{1}{2}$ -6 x 5 - $5\frac{1}{2}$ inches; weight 2-3 pounds. Shape nearly globular to short oval, rounded at the base and apex; blossom scar very small and obscure; ribs slightly prominent, $1\frac{1}{4}$ inches broad at the medial; furrows narrow, moderately shallow and smooth. Netting very sparse to absent, finely interlaced and streaked; cork very light, distributed very unevenly; interstices very shallow. Skin color pale orange yellow. Flesh pale orange yellow, moderately thin, 1 - $1\frac{1}{4}$ inches; texture fine, fiberless, soft and juicy; slightly sweet, mildly flavored, and strongly aromatic; quality fair to poor. Cavity medium large, $3\frac{1}{2}$ x $2\frac{3}{4}$ inches, circular in cross-section. Rind medium thick, $\frac{1}{8}$ inch, soft and weak.

Paul Rose. Refs. 29, 41, 53, 64, 70, 75, 95, 97, 99, 100, 101, 105, 108, 109, 110, 115, 116, 118, 129, 133, 136, 140, 141, 143. Syns. Osage Gem, Petosky, Salmon Fleshed Gem, Salmon-fleshed Genesee.

In the early nineties the two most important varieties in the Michigan cantaloupe belt were the Osage and the Netted Gem. Crosses between these varieties occurred on the farm of Roland Morrill of Benton Harbor, Michigan. Paul Rose of South Frankfort, Michigan, a neighbor and friend of Mr. Morrill, began the selection work which led to the introduction of the Paul Rose melon from plants of one of these crosses. Mr. Rose named his new melon Petosky, but when J. C. Vaughan of Chicago purchased the seed stock and introduced it in 1898, he renamed it the Paul Rose. This new variety became one of the most popular sorts ever introduced. It proved to be just the size required for a good market melon and had those characteristics of flesh and shell which made it "carry further and stand up longer" than any other sort.

It is a midseason sort, coming into season 3 or 4 days earlier than Burrell's Gem, in season with Hearts of Gold and about a week later than Delicious. The fruits are similar in shape to Burrell's Gem although somewhat shorter. The netting is similar, but is coarse and not as uniformly interlaced. They are much the same in flesh characteristics.

Plant vigorous; vines moderately heavy; branches moderately many.

Fruit moderately small, 6 - $6\frac{1}{2}$ x 5 - $5\frac{1}{2}$ inches; weight 2 - $2\frac{1}{2}$ pounds. Shape short oval, base and apex rounded, blossom scar moderately conspicuous; ribs slightly prominent, $1\frac{1}{2}$ - $1\frac{3}{4}$ inches broad at the medial; furrows distinct, moderately broad, moderately shallow and smooth. Netting abundant, moderately fine interlaced; cork moderately light, distributed rather uniformly over the ribs, base and apex; interstices moderately shallow. Skin color dark green, slightly mottled with yellowish green at full maturity. Flesh salmon orange, moderately thick, $1\frac{1}{2}$ - $1\frac{3}{4}$ inches; texture moderately fine, slightly fibrous, rather firm, moderately juicy;

sweet, somewhat sprightly, highly flavored and pleasantly aromatic; quality good. Cavity moderately small, $3\frac{1}{4}$ x 2 inches, triangular in cross-section. Rind medium thick, $\frac{1}{8}$ inch, strong and tough.

Pearl Pink Meat. Refs. 15, 54, 105. Syns. Abbott's Pearl, Buckskin, Pearl Pink, Pearly Pink, Pink Pearl.

This melon, which was introduced in 1923 by D. V. Burrell, Rocky Ford, Colorado, and C. C. Morse & Co., San Francisco, has been grown with success in the New Jersey, Delaware and Maryland section. As originally introduced, the name Abbott's Pearl was used by C. C. Morse but was dropped after 1925. The name Pearl Pink Meat or Abbott's Pearl was used by Burrell and is the name under which the variety is known today. G. W. Abbott, a leading grower of Rocky Ford, was the originator, and perfected the stock after several years selection.

This is a moderately late variety maturing at Geneva 4 or 5 days earlier than Montreal Market, in season with Rocky Ford and Oregon Delicious, and about a week later than Sugar Rock. The variety most resembles Burrell's Gem and Oregon Delicious in shape, being much smaller than the latter and not as tapered at the ends as the former. The netting is most like that of Sugar Rock, but is much more abundant and more closely interlaced.

Plant vigorous; vines coarse and heavy; branches moderately many.

Fruit moderately small, $5\frac{1}{2}$ -6 x $4\frac{1}{2}$ -5 inches; weight $1\frac{1}{2}$ -2 pounds. Shape short oval, apex even, occasionally somewhat raised, base full; ribs moderately obscure; furrows narrow, very shallow, netted and extend from base to apex. Netting abundant, coarsely interlaced, somewhat circular in pattern at the ends; cork very heavy, distributed uniformly over the entire fruit; interstices deep; skin color grayish green, turning to pale cream at full maturity. Flesh orange, medium thick, $1\frac{1}{4}$ - $1\frac{1}{2}$ inches; texture fine, moderately firm, moderately juicy, slightly fibrous; sweet, rather highly flavored, pleasant aroma; general quality good. Cavity small, 3 x $1\frac{1}{2}$ inches, circular in cross-section. Rind medium thick, $\frac{1}{8}$ inch, tough and strong.

Peerless Pearl. Ref. 54. Syn. Abbott's Peerless Pearl.

This was a selection from Abbott's Pearl and was introduced in 1928 by D. V. Burrell, Rocky Ford, Colorado. With the exception of the paper-white seed it was similar in most respects to Pearl Pink Meat.

Plant vigorous; vines moderately heavy; branches moderately many.

Fruit moderately small, $5\frac{1}{2}$ -6 x $4\frac{1}{2}$ -5 inches; weight 2 - $2\frac{1}{2}$ pounds. Shape short oval, base full to slightly extended, apex even; blossom scar obscure; ribs obscure, $1\frac{3}{4}$ inches broad at the medial; furrows very narrow and very shallow, netted. Netting very abundant, moderately fine interlaced; cork very heavy and thick, distributed uniformly over the entire fruit; interstices deep. Skin color pale grayish green. Flesh salmon orange, medium thick, 1 - $1\frac{1}{4}$ inches; texture slightly coarse and fibrous, firm and moderately juicy; sweet, highly flavored and pleasantly aromatic; quality very good. Cavity moderately small, $3\frac{1}{2}$ x $2\frac{1}{2}$ inches, circular in cross-section. Rind thick, $\frac{1}{4}$ inch, very strong and tough. Seeds white.

Perfected Delmonico. Refs. 11, 29, 97, 98, 100, 133.

This was a selection from Delmonico which was introduced in 1889 by Peter Henderson. The new melon offered by that concern in 1894 was smaller in

size and nearly a perfect globe shape. This strain replaced the older Delmonico and was considered rather superior in quality, but the variety was not offered after 1906.

Perfection. Refs. 22, 23, 26, 33, 38, 39, 48, 53, 60, 61, 62, 73, 88, 91, 96, 97, 99, 100, 101, 105, 107, 124, 125, 133, 140, 144. Syns. Mammoth Perfection, Minnesota Perfection, New Princess, Princess, The Princess, Yellow Fleshed Perfection.

The Perfection melon appears to have been introduced by Wm. Henry Maule, Philadelphia, Pa., in 1889. According to the story in their catalog for that year, seeds had been secured from a customer from Chenango County, N. Y. The variety was rather widely cataloged. A very similar melon was offered in 1892 under the name Princess by Johnson & Stokes of Philadelphia. This was said to have originated as a chance seedling in a field of melons near Boston, Mass.

Fruit medium large, 6-7 x 5-6 inches; weight 4½-6 pounds. Shape short oval to nearly globular, slightly depressed about the base, apex full; blossom scar obscure; ribs moderately prominent, 1½-1¾ inches broad at the medial; furrows medium broad, deep and smooth. Netting abundant, coarsely interlaced; cork heavy and rather uniformly distributed over the ribs; interstices moderately deep. Skin color deep orange sparsely mottled with green. Flesh orange yellow; moderately thick, 1½-1¾ inches; texture coarse and fibrous, soft and juicy; very sweet, highly flavored and mildly aromatic; quality good to very good. Cavity moderately small, 3-3½ x 2-2½ inches, circular in cross-section. Rind thick, ¼ inch, strong and moderately tough.

Persian. Refs. 3, 15, 22, 30, 38, 57, 58, 92, 105, 108, 109, 110, 127, 133, 139.

Although a great many varieties of this type are grown in Asia Minor, there are few grown in this country. The most important sort is known as Persian or Armenian and is of chief importance in the hot valleys of southern and central California and in Arizona. The Persian is a large fruited sort, 7-10 inches in diameter in both dimensions, nearly globular in shape, without ribs, and profusely and uniformly covered with a rather light, moderately broad netting. The flesh is very thick, pink in color, very fine textured and, when properly harvested and stored, has a good flavor and distinctly pleasant aroma. When allowed to remain on the vine until a partial slip of the stem is possible, the skin assumes a yellow or a slightly red tint. Fruits picked for long shipments, however, have a moderately dark green skin color.

The Turkish melon is another of this type, but is oblong in shape and distinctly ribbed. It is of little importance in American trade at the present time.

Pineapple. Refs. 20, 24, 26, 38, 42, 44, 45, 46, 90, 92, 93, 108, 133, 138, 142. Syns. Gautner's Pineapple, Green Fleshed Pineapple, Improved Pineapple, Murray's Pineapple, Netted Pineapple, Pineapple Citron, Rocky Ford Pineapple.

The name occurred in the catalog of Breck, 1838, and G. Thorburn & Sons, 1824. Little is known about the variety, for the descriptions in early catalogs were

short and since there were few varieties known, comparisons with similar sorts were not possible. Hovey in 1859 describes Pineapple; as "Green flesh, sweet, a superior variety." In the Gardeners' Chronicle of 1841 it is mentioned as a desirable variety. Undoubtedly the type as known in early times changed somewhat, and the name was later used for some of the Nutmeg, Citron, and Netted Gem strains.

Pollock 10-25. Refs. 15, 17, 36, 54, 58, 64, 65, 72, 78, 79, 95, 105, 109, 110, 129. Syns. Golden Pollock, Improved Pollock, Missionary Belle, Mission Bell, Pollock, Pollock Rocky Ford, Queen of Gems, Rust Resistant Pollock, Ten Twenty-five.

While working to improve the separate strains of Pollock No. 25, P. K. Blinn and James B. Ryan selected and planted separately seed from melons with thick salmon-colored flesh. After five years one of these strains proved to be superior and was in 1916 named Salmon Tint Pollock 10-25 and introduced by the Rocky Ford Cantaloupe Seed Breeders Association. For ten years this strain was the standard of comparison for all other varieties in the Rocky Ford group.

The variety is 5 or 6 days earlier than Texas Cannon Ball, in season with Rocky Ford and Edwards Perfecto, and 6-8 days later than Sugar Rock. It is much like Rocky Ford in exterior appearance, being somewhat more uniformly globular than that variety and the flesh has a larger percentage of orange color flesh near the cavity.

Plant moderately vigorous; vines moderately heavy; branches moderately few.

Fruit moderately small, 5-5½ x 5-5½ inches; weight 1½-2 pounds. Shape globular, symmetrical; base full, occasionally slightly extended; apex even; blossom scar obscure; ribs and furrows absent. Netting abundant, finely interlaced; cork moderately heavy, distributed evenly over entire fruit; interstices medium deep. Skin color dark green. Flesh light green with a prominent salmon orange area about the cavity, medium thick, 1¼-1½ inches; texture slightly coarse and fibrous, moderately firm and rather juicy; sweet and sprightly, rather highly flavored and pleasantly aromatic, quality good. Cavity small, 2½ x 1¾ inches, triangular in cross-section. Rind medium thick, ⅛ inch, strong and tough.

Pollock No. 25. Refs. 15, 58, 64, 105, 109, 110, 121, 129. Syns. Gold Fleshed Rocky Ford, Mayview Favorite, Orange Fleshed Rocky Ford, Orange Flesh Pollock, Pink Fleshed Rocky Ford, Pink Meat Netted Rock, Pink Meated Rocky Ford, Pollock Pink, Rocky Ford Pink Meat, Salmon Flesh Eden Gem, Salmon-fleshed Netted Gem, Salmon-fleshed Rocky Ford, Salmon Tinted Pollock, Salmon Tinted Pollock No. 25.

The Pollock type has been gradually developed and improved at Rocky Ford, Colorado for the last 40 years. In 1895 J. P. Pollock at Holbrook began to grow melons and started selection of a new type from the Rocky Ford or Netted Gem. Mr. Pollock saved seed from plants most resistant to rust and by chance these plants produced fruits which were less ribbed and more heavily netted than the original stock. The selection became known as the Pollock strain. This showed a tendency to some color variation. In some specimens the salmon

coloring showed as a clean cut zone around the seed cavity with a green layer near the rind, in others the green and salmon colors were mottled or blended together and in still others the colors were in irregular patches, possibly the green on one side and the salmon color on the other. In some melons the whole flesh was a solid salmon color and in others the flesh was entirely green. Some years later P. K. Blinn and James B. Ryan separated this original variable stock into two strains.

In 1909 the Rocky Ford Cantaloupe Seed Breeders Association introduced these strains as Rust-resistant Pollock No. 25, Green Meat and Salmon Tint. They were immediately popular and were widely adopted both in Colorado and the Imperial Valley in California.

Reedland Giant. Refs. 29, 33, 47, 53, 90, 96, 133. Syn. Reedland's Giant Citron.

One of the very largest melon varieties to be offered, the Reedland, was not of good uniform quality and never became very popular. Because of its size it was often called The King of the Cantaloups. It was listed by Landreth and by Vaughan in 1887. The flesh was green and quite highly flavored but rather thin and, therefore, not suitable for handling.

Rittenhouse Special.

This melon was offered in 1927 by Vaughan's Seed Store, Chicago. It was one of the latest varieties matured at Geneva, in season with Weaver Special and Honey Ball and 4-6 days later than Montreal Market. It is similar to Bender's Surprise in shape but is much less ribbed. The netting is similar to that of Carolina Clark while the skin color is much the same as Sugar Rock.

Plant vigorous; vines coarse and heavy; branches many.

Fruit moderately large, 7-7½ x 6-6½ inches; weight 5-6 pounds. Shape nearly globular to short oval, slightly flattened at base and apex; blossom scar rather conspicuous, often bordered with a corky ring; ribs obscure; furrows very shallow, rather narrow and usually slightly netted. Netting sparse, coarsely interlaced, often streaked; cork light, unevenly distributed over the surface; interstices shallow. Skin color pale bluish green later turning to grayish green, sparsely mottled with pale creamy yellow. Flesh orange; medium thick, 1¼ inches; texture fine, fiberless, soft and juicy; sweet, rather highly flavored and distinctly aromatic, quality good. Cavity large, 4 x 3 inches, circular in cross-section. Rind thick, ¼ inch, rather weak and moderately tender.

Rocky Dew.

The Kilgore Seed Co., Plant City, Florida, first offered this new variety in their 1934 catalog. According to the introductory statement it was discovered in the West Indies by a representative of the Kilgore Company. Repeated tests in Florida and other southeastern districts showed that it was particularly adapted to growing conditions as found in the South.

This was one of the latest melons grown at Geneva, maturing about a week or ten days later than Rocky Ford, 3-4 days later than Montreal Market and Giant. The fruits are more oblong, more tapered at the base and considerably less netted than those of Rocky Ford. The skin color is similar to that of Honey Dew, although in the earlier stages it is a much darker green. The flesh,

although somewhat thinner, is much like that of Honey Dew in color and texture.

Fruit moderately small, 6-6½ x 4½-5 inches; weight 2½-3 pounds. Shape oval, somewhat tapered at the base; apex rounded, even; blossom scar conspicuous; ribs obscure; furrows narrow, very shallow and smooth. Netting sparse, very finely streaked; cork very light, unevenly distributed over the ribs; interstices shallow. Skin color greenish yellow later turning to bright yellow. Flesh bright green, moderately thick, 1½-1¾ inches; texture fine, fiberless, very firm and moderately juicy; sweet, sprightly, highly flavored and pleasantly aromatic; quality good. Cavity small, 3¼ x 1½ inches, circular in cross-section. Rind medium thick, ⅜ inch, moderately hard and tough.

Rocky Ford. Refs. 5, 15, 16, 18, 19, 26, 29, 41, 45, 53, 54, 58, 63, 64, 65, 70, 72, 73, 75, 85, 97, 100, 101, 102, 105, 108, 109, 110, 116, 117, 121, 123, 133, 136, 137, 140, 141, 143. Syns. Blue Ribbon Gem, Blue Ribbon Rocky Ford, Buskirk, Buskirk's Blight Proof, Colorado, Delicious Gold Lined, Delicious Rocky Ford, Early Victor, Eden Gem, Eden Gem Select, Emerald and Gold, Extra Select Rocky Ford, Gem of Eden, Golden Gem Rocky Ford, Golden Sugar, Gold Lined, Gold Lined Netted Rocky Ford, Gold Lined Rocky Ford, Green Fleshed Rocky Ford, Hart's Victor, Honey Sweet, Ideal Eden Gem, Improved Rocky Ford, Improved Rust Resistant, Johnson's Colorado, Junior Rocky Ford, Mammoth Rocky Ford, Melting Gold, Money Maker, Nebraska Gold Lined, Netted Rock, Netted Rock King, Oklahoma, Perfected Rocky Ford, Perfection Rocky Ford, Pineapple Rocky Ford, Robinson's Delicious, Rock King, Rocky Ford Gem, Rocky Ford Netted Gem, Rocky Ford Nutmeg, Rocky Ford Rust Resistant, Rocky Ford Selected, Rust Proof Rocky Ford, Select Solid Net, Solid Rock, Sweetmeat, Ten to One, Van Buskirk Netted King, Van Buskirk's Netted Rock, Victor, Victory, Ward's Ideal, Watter's Solid Net, Watter's Solid Net Rocky Ford.

Burpee's Netted Gem under the favorable conditions which prevailed in the arid regions of Colorado was developed into a melon surpassing in appearance and quality the parent stock. This was called the Rocky Ford. The honor of growing the first Rocky Ford melons for market is accredited to J. W. Eastwood who in 1885 planted about one-half acre of Netted Gem seed received direct from Burpee. The same season J. E. Gauger near La Junta also tried a small planting of the Netted Gem. In succeeding years the extent of the melon industry in this region greatly increased and it was natural that the melons shipped from there should come to be known as Rocky Fords. Many selections were made and it is possible that some natural crossing occurred.

Within the group of Rocky Ford melons there has come into existence a large number of variety or strain names. The majority of these strains represent a gradual change from the original oblong, smooth-furrowed Netted Gem to the globular, heavily netted melon of today. Attention is called to the Pollock strains and to Hale's Best which are treated elsewhere.

These belong in the same group, but because of certain superior qualities, became major sorts, even displacing Rocky Ford itself.

It is a moderately late variety, maturing 5-6 days earlier than Montreal Market, in season with Pollock 10-25 and Perfecto and 4-6 days later than Hearts of Gold. It is practically the same as Pollock 10-25 in exterior appearance, the fruits being slightly more oval. The flesh has a greater percentage of green with a narrower yellowish gold lining about the cavity instead of a rather broad orange colored area. The present day stocks are much heavier netted, less furrowed and more globular in shape than the original Netted Gem.

Plant vigorous: vines moderately heavy; branches moderately many.

Fruit moderately small, $4\frac{1}{2}$ - $5\frac{1}{2}$ x 4-5 inches, weight $1\frac{1}{2}$ -2 pounds. Shape nearly globular, base and apex rounded and full; blossom scar obscure; ribs obscure, $1\frac{3}{8}$ - $1\frac{1}{2}$ inches broad at the medial; furrows very shallow, narrow and netted. Netting abundant, finely interlaced; cork moderately heavy and distributed uniformly over the entire surface; interstices moderately deep. Skin color dark green, later becoming mottled with yellowish bronze. Flesh green with a narrow gold lining about the cavity; moderately thin, $1-1\frac{1}{4}$ inches; texture rather coarse and slightly fibrous, medium firm and juicy; very sweet and sprightly, rather highly flavored and pleasantly aromatic; quality good. Cavity small, $2\frac{1}{2}$ x 2 inches, triangular in cross-section. Rind medium thick, $\frac{1}{8}$ - $\frac{1}{4}$ inch, strong and tough.

Sill's Hybrid. Refs. 8, 43, 45, 46, 98, 99, 134. Syn. Sill's.

This was a melon offered in 1870 by James J. H. Gregory & Sons of Marblehead, Massachusetts. Many of the early descriptions compared the variety to White Japan, especially in earliness and sweetness. Some considered it to be a cross between White Japan and Christiana. This type was the progenitor of melons in the Osage and Surprise group.

Silver Netted. Refs. 29, 133.

This variety was the forerunner of the better known Texas Cannon Ball. It was known as Shumway's Silver Netted and was described as having resulted from a cross between a French Cantaloupe and an American muskmelon. It was listed by R. H. Shumway of Rockford, Illinois sometime previous to 1894.

Six Oaks. Refs. 10, 29, 53, 97, 98, 99, 100.

James J. H. Gregory & Sons of Marblehead, Massachusetts, introduced the Six Oaks Cantaloupe in 1894. The melons were green-fleshed, deeply ribbed, well netted and nearly round in shape. From the illustration shown this was a melon quite similar to the Hackensack but less flattened and larger.

Skillman's Netted. Refs. 20, 24, 25, 28, 29, 45, 46, 49, 52, 53, 55, 96, 99, 100, 105, 108, 127, 131, 133, 136, 138, 139, 140, 145. Syns. Skillman, Skillman's Early, Skillman's Fine Netted, Skillman's Green, Skillman's Netted Gem, Skillman's Netted Nutmeg.

This is one of the oldest named varieties of which we have definite record. Listed by Hovey in 1834 and Thorburn in 1837 and mentioned by Bridgman in 1857,

Watson 1860 and Burr 1863, this constitutes a record for age that few American varieties possess. Likewise we find that it has continued in use until recent times, for the name occurs in the 1918 catalog of Cadwell & Jones and in 1923 for Carters Tested Seeds, Inc. Early descriptions indicate that it was a subvariety of Green Nutmeg and was known as the earliest of the green-fleshed sorts.

The fruits matured early, about in season with Early Green Nutmeg. It apparently was very much like that variety in shape but was smaller, more distinctly ribbed and more finely netted and interlaced.

Fruit small, $4-4\frac{1}{2}$ x $4-4\frac{1}{2}$ inches; weight $1-1\frac{1}{2}$ pounds. Shape globular, base slightly flattened and depressed about the stem, apex full; ribs moderately prominent, furrows broad, moderately shallow and netted. Netting abundant, finely interlaced, distinctly streaked and circular in pattern about the base and apex; cork moderately light, distributed uniformly over the surface, interstices shallow. Skin color dark bronze buff at full maturity. Flesh green, moderately thin, $1-1\frac{1}{4}$ inches; texture moderately coarse, tender; very sweet; quality good. Cavity very small, 2 x $1\frac{1}{2}$ inches, circular in cross-section. Rind thick, $\frac{1}{4}$ - $\frac{3}{8}$ inch, moderately strong and tough.

Southern Beauty. Refs. 53, 96, 97, 99, 100, 103.

Little is known of the history of this variety or the extent to which it was grown. The first listing of the variety was found in the 1895 catalog of the Lovett Company of Little Silver, New Jersey. It was listed by Vaughan in 1897 and by Griffith and Turner in 1902. The latter firm recommended it as particularly suited to the southern climate. The flesh was thick, green, and had a rich, spicy or aromatic flavor.

Spicy. Ref. 136.

The Spicy melon is strikingly distinct in the quality and flavor of the flesh. The original seed came from a grower in Minden, Louisiana, where it was seen in 1906 by a Burpee representative. After testing for three more seasons, the variety was introduced in 1910 by W. Atlee Burpee. The quality of Spicy has been likened to that of some of the greenhouse grown foreign melons. Although the variety name has continued until recently in the Burpee catalogs, it has not been generally listed by other concerns.

It was a late variety, 3-4 days earlier than Giant, in season with Montreal Market and 10 days or two weeks later than Hale's Best. It is most like Golden Cream in shape and netting characteristics. The skin is more like that of Honey Ball, although the flesh is orange instead of green.

Fruit medium large, $6\frac{1}{2}$ -7 x $4\frac{1}{2}$ - $5\frac{1}{4}$ inches; weight 3- $3\frac{1}{2}$ pounds. Shape moderately long oval; base full and rounded; apex rounded; blossom scar corky and conspicuous; ribs slightly prominent; $1\frac{1}{2}$ -2 inches broad at the medial; furrows medium narrow, medium depth and smooth. Netting very sparse, finely interlaced and very short streaked; cork very light, unevenly distributed over the surface. Skin color pale lemon yellow. Flesh pale orange, medium thick, $1\frac{1}{4}$ - $1\frac{3}{8}$ inches; texture fine, fiberless, moderately soft and juicy; sweet, sprightly, highly flavored and pleasantly aromatic; quality good. Cavity medium large, $4\frac{1}{4}$ x $2\frac{1}{2}$ inches, triangular in cross-section. Rind moderately thin, $\frac{1}{8}$ inch, light yellow, rather soft and tender.

Superior. Refs. 29, 33, 38, 53, 96, 97, 100, 127, 133, 144.
Syn. New Superior.

This melon originated with a grower in New Jersey and was introduced in 1892 by W. Atlee Burpee of Philadelphia. The illustration shows a melon nearly round, without ribbing, but covered with a heavy dense netting.

Supreme. Ref. 60. Syn. Giant Emerald Gem.

Child's Supreme muskmelon was introduced in 1918 by John Lewis Childs, Inc. of Floral Park, N. Y. It was originated by George Ashworth, Locust Valley, Long Island. It was a late variety which matured about in season with Montreal Market and 6-8 days later than Hollybrook Luscious. It was similar to the latter in shape and skin color but was considerably larger than that variety and had a deeper orange colored flesh.

Fruit very large, 9-10 x 7-8 inches; weight 10-12 pounds. Shape oblong, rather lopsided, base full and rounded, apex full, often with rather prominent navel; blossom scar very conspicuous; ribs prominent, variable in width; furrows broad, irregular in depth, smooth. Netting practically absent, when present very fine and patchy. Skin color very dark green. Flesh deep orange yellow, moderately thick, $1\frac{1}{2}$ - $1\frac{3}{4}$ inches; texture fine, fiberless, rather firm and juicy; sweet, rather highly flavored and distinctly aromatic; quality very good. Cavity very large, 5 x 4 inches, circular in cross-section. Rind thin, $\frac{1}{8}$ inch, very soft and weak.

Surprise. Refs. 4, 6, 15, 22, 25, 26, 28, 29, 43, 44, 45, 46, 48, 49, 53, 70, 84, 90, 91, 98, 99, 100, 101, 105, 107, 108, 109, 124, 127, 128, 133, 136, 139, 144.
Syns. Baker, Early Surprise, Extra Selected New Surprise, New Surprise, Telephone, Young's Selected Surprise.

The Surprise melon, introduced in 1876 by Price and Knickerbocker of Albany, N. Y., was considered the greatest contribution to the list of melon varieties of that period. This judgment was well founded for the type, represented first by Surprise and successively by Irondequoit, Tip Top, Bender Surprise and Baker's Surprise, has been one of the best groups for the local market and roadside stand. The exact origin of the variety is unknown. Mr. Price, who was responsible for its selection and introduction, left no record of the varieties entering into its parentage. By many it was considered to have come from a cross between White Japan and Sill's Hybrid.

It is a midseason sort maturing 3 or 4 days earlier than Hale's Best, in season with Osage, and 3 or 4 days later than Bender. It is most like Bender, differing from that variety in being smaller, more irregularly ribbed and less uniformly netted. The flesh is paler orange in color, somewhat thinner and coarser in texture.

Plant vigorous; vines heavy; branches many.

Fruit moderately large, 7-8 x $5\frac{1}{2}$ -6 inches; weight 6-7 pounds. Shape short oval to nearly globular, often slightly lopsided, base slightly flattened, apex full; blossom scar not very conspicuous; ribs prominent, $1\frac{3}{4}$ inches broad, irregular; furrows broad, moderately shallow to deep, smooth. Netting sparse, patchy, often streaked; cork moderately heavy, distributed very unevenly over the surface. Skin color light creamy yellow. Flesh light orange; medium thick, $1\frac{1}{4}$ - $1\frac{1}{2}$ inches; texture medium coarse and rather fibrous, soft and juicy; sweet, very mildly flavored and faintly aromatic; quality

fair to moderately good. Cavity large, 4 x 3 inches, circular in cross-section. Rind moderately thin, $\frac{1}{8}$ inch, soft and weak.

Tip Top. Refs. 6, 15, 29, 53, 54, 58, 64, 97, 98, 99, 100, 101, 105, 109, 110, 115, 128, 129, 140, 141. Syns. Mosley Tip Top, Nutmeg Tip Top.

A. W. Livingston's Sons, Columbus, Ohio, offered Tip Top in 1892. The history of this variety, according to the Livingston catalog, is that a gentleman living in Lancaster County, Pennsylvania, discovered a peculiar melon growing in a neighbor's field where various kinds were planted for market, among them Surprise, Hackensack, Jenny Lind, and others. Out of curiosity it was cut and tested for quality, with the result that all present were astonished at its excellence. Seed saved from this melon was carried to Ohio and planted there. The fruits proved to be "Tip Top" in every particular. When introduced into California this melon soon became one of the leading sorts. Tip Top belongs in the Surprise group which produces the greater part of the large sized salmon-fleshed melons found on our markets. It is so similar to Irondequoit that today the two are considered practically synonymous.

Triumph. Refs. 26, 29, 53, 60, 97, 98, 99, 100, 133.
Syns. Beck's Triumph, New Triumph, Triumph Hybrid.

This variety was offered for the first time in 1895 by A. W. Livingston's Sons, Columbus, Ohio. Seed had been secured from Antone Beck of Oregon, Illinois. Mr. Beck was also the originator of the Columbus melon, a green-fleshed sort which he crossed with Osage to produce the Triumph.

It was a midseason sort, 4-5 days later than Extra Early Hackensack and in season with Long Island Beauty. The fruits were similar to Extra Early Hackensack in size and shape, although usually more globular and not as uniformly netted.

Fruit medium large, 6- $6\frac{1}{2}$ x 6- $6\frac{1}{2}$ inches; weight $2\frac{1}{2}$ -3 pounds. Shape globular, often slightly flattened at the ends; blossom scar large and corky, conspicuous; ribs slightly prominent, $1\frac{1}{4}$ - $1\frac{1}{2}$ inches broad at the medial; furrows broad, shallow and smooth. Netting rather sparse, medium finely interlaced; cork rather light and unevenly distributed over the ribs. Skin color very dark green later turning to dull orange brown, profusely mottled with cream color. Flesh light green, moderately thin, $1\frac{1}{4}$ inches; texture coarse and fibrous, soft and juicy; very sweet, mildly flavored and mildly aromatic; quality fair to moderately good. Cavity moderately large, $3\frac{3}{4}$ x 3 inches, circular in cross-section. Rind thick, $\frac{1}{4}$ inch, rather soft and weak.

Tye. Syn. Early Tye.

This melon probably came from an accidental cross between one of the American varieties and a melon of the extra early Russian type such as Page's Early. It bears the name Tye because it was discovered and improved by Otis A. Tye of Yucca, North Dakota. Oscar H. Will & Co. of Bismarck, North Dakota, have been growing strains of this melon for twenty years, and that offered in their catalog of 1934 is recommended for both earliness and quality.

The variety is a moderately early one at Geneva, maturing 4 or 5 days earlier than Acme, in season with

Extra Early Osage, and 4 or 5 days later than Golden Champlain and Fordhook. In shape it resembled Acme and Knight, although it was considerably less netted than those varieties. The skin color was much like that of Bender, and the flesh somewhat lighter orange.

Plant weak; vines slender; branches few.

Fruit moderately small; $6\frac{1}{2} \times 4\frac{1}{2}$ inches; weight 2-2 $\frac{1}{2}$ pounds. Shape long oval, occasionally somewhat fusiform; base full to slightly extended; apex raised; blossom scar obscure, ribs slightly prominent, $1\frac{1}{2}$ inches broad at the medial; furrows medium broad, rather shallow and netted. Netting moderately sparse, coarsely interlaced and streaked; cork moderately heavy and broad, distributed unevenly over the surface; interstices moderately shallow. Skin color creamy yellow. Flesh orange; moderately thin, $1\frac{1}{4}$ inches; texture very fine, fiberless, soft and moderately juicy, moderately sweet, mildly flavored and mildly aromatic; quality fair to poor.

Ward's Nectar. Refs. 25, 28, 29, 44, 46, 51, 53, 91, 93, 94, 98, 99, 100, 127, 131, 133, 134, 144.

Ward's Nectar is recorded as being listed in 1849 by Hovey, 1869 by Gregory and 1883 by Henderson. In 1886 after being grown in the trials at Geneva the following was written: "The Golden Netted Gem, Jenny Lind and this are all subvarieties of one variety, and this variety is the smaller prototype of the Green Citron or Early Nutmeg." Well developed fruits were 4 inches in diameter in both directions; flesh green with a yellowish line next the seeds; very tender, sweet and delicious.

Weaver Special. Refs. 54, 81. Syns. Imperial, Imperial Special, Special Imperial White Melon, Sunkist.

Weaver Special, which under the name of Sunkist was given an Award of Merit in the 1935 All-America rating, seems destined to become one of the leading standard varieties both for shipping and the home garden. In 1930, J. C. Fluke, who was the manager at Brawley, California, for C. H. Weaver Co., discovered a white-skinned melon which he believed was a promising type. After two years, the type seemed fairly well fixed and seed was then sent to James B. Ryan, a melon grower of long experience and one of the founders of the Rocky Ford Cataloupe Seed Breeders Association, for further development and improvement.

Mr. Ryan and his associates carried on selective work for six generations in order to eliminate some of the undesirable characteristics of the new variety. At the suggestion of Mr. Fluke the name Weaver Special was selected. The parentage of the variety is unknown. By some it is thought to have come from a cross between Honey Ball and Hale's Best but no definite record is available.

This is a late melon which matured at Geneva a week or ten days later than Bender's Surprise, 4 or 5 days later

than Honeymel, and in season with Honey Ball. The fruits most resemble Honeymel in general appearance, differing from that variety in being more globular, more profusely and uniformly netted and in having an orange colored flesh. It is similar to the Honey Dew in color of skin, but lacks the size and flesh color of that variety.

Plant moderately vigorous; vines moderately heavy; branches many.

Fruit moderately small, $5\frac{1}{2} \times 5\frac{1}{2}$ inches; weight 2 $\frac{1}{2}$ -3 pounds. Shape globular, symmetrical, blossom scar obscure; ribs and furrows absent. Netting abundant, moderately fine interlaced; cork light, uniformly distributed over the surface; interstices shallow. Skin color pale creamy yellow tinted with green. Flesh orange; medium thick, $1\frac{1}{4}$ - $1\frac{1}{2}$ inches; texture fine, very slightly fibrous, moderately firm and rather juicy; very sweet, rather highly flavored and pleasantly aromatic; quality very good. Cavity small, $2\frac{1}{2} \times 1\frac{3}{4}$ inches, triangular in cross-section. Rind thick, $\frac{1}{4}$ inch, greenish yellow, strong and tough.

White Japan. Refs. 1, 4, 25, 26, 28, 44, 46, 49, 53, 55, 63, 66, 98, 99, 100, 105, 127, 130, 133, 136, 144. Syns. American Beauty, Early White Japan, Improved White Japan, Japan, Japan Silver-striped White, New White Japan, White Japanese, Yellow Fleshed Japan, Yellow Meated Japan.

This melon was one of the earlier varieties, having been mentioned by Burr in 1863. It was understood to have been brought to this country by a member of Commodore Perry's Japanese Expedition of 1853-54. Wm. S. Carpenter, horticulturist of New York introduced the melon to the public and it was listed by Gregory in 1866 and Bliss in 1868. Inasmuch as the color of this melon excited particular notice, it is probable that this was the first variety with this characteristic offered in this country.

White Japan produced mature fruits at Geneva in midseason, about 3 or 4 days earlier than Benders Surprise, in season with Sugar Rock, and about 3 or 4 days later than Delicious. It was similar to Bender's Surprise in general appearance, but differed from that variety in being smaller, less symmetrical, less uniformly netted, and in having paler orange flesh color.

Plant vigorous; vines heavy and coarse; branches moderately few.

Fruit medium large; $6\frac{1}{2} \times 6\frac{1}{2}$ -7 inches; weight 3 $\frac{1}{2}$ -4 pounds. Shape nearly globular, slightly flattened at base and apex; blossom scar large and conspicuous, corky; ribs rather prominent, $1\frac{1}{2}$ - $1\frac{3}{4}$ inches broad at the medial; furrows medium broad, medium depth and usually smooth, occasionally netted. Netting rather sparse, coarsely interlaced often long streaked; cork heavy, distributed unevenly over the ribs; interstices moderately deep. Skin color creamy yellow. Flesh pale orange, medium thick, $1\frac{1}{4}$ - $1\frac{1}{2}$ inches; texture slightly coarse and moderately fibrous, soft and juicy; moderately sweet, mildly flavored and mildly aromatic; quality fair to moderately good. Cavity medium large, $3\frac{1}{2} \times 3$ inches, circular in cross-section. Rind thick, $\frac{1}{4}$ inch, medium soft and rather tender.

SUPPLEMENTARY LIST OF OBSCURE VARIETIES

The names given below represent varieties which are of minor importance and about which little information is available; varieties which were in existence for

a very short period; or varieties the seed of which is not available today.

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|------------------------------------|--|--------------------------------------|--|
| Albany Market. Ref. 133. | Early June. Ref. 133. | Japan Rock. | Portales Gem. |
| All the Year. | Early Market. | Jasper. | Prize. Ref. 133. |
| Ambulance. Ref. 133. | Early Polignac. | Jewel. Ref. 133. | Prospero. |
| American Breakfast. Ref. 133. | Early Prize. Ref. 29. | John Harvey. | Quality King. |
| Andalusia. | Early Yellow. Ref. 133. | Johnson's Big Wonder. | Queen. Refs. 29, 48. |
| Angelo. Ref. 75. | Extra Early Prize. Refs. 26, 53, 133. | Klondike. Ref. 133. | Rajah. Ref. 133. |
| Augusta Market. Refs. 40, 97, 133. | Extra Early Roof. Ref. 101. | Krooke. Ref. 133. | Romana. |
| Autumn. Ref. 133. | Free Lunch. | Large African. | Round Yellow. Refs. 29, 44, 133. |
| Berkley. Ref. 133. | French Perfection. Ref. 133. | Large Cantaloupe. Ref. 38. | Runyon. Ref. 101. |
| Bittners Blight-proof. | Golden Jewel. | Large Mexican. | Salmon and Green. Refs. 33, 38, 53, 133. |
| Black African. | Golden Rock. | Large Musk. Ref. 138. | Salmon King. |
| Black Jap. Refs. 5, 133. | Golden Seal. | Large Netted. Ref. 133. | Satisfaction. Refs. 98, 99, 100. |
| Black Paris. Ref. 97. | Golden Superb. Refs. 43, 44, 45. | Large Yellow. | Siam Netted. Ref. 108. |
| Black Swedish. | Golden Triumph. | Magnificent. | Sibley's Best. Refs. 35, 48. |
| Borneo. Ref. 55. | Golden West. | Maize Market Garden. Ref. 108. | Skinner's Netted. |
| Brant. | Gold Winner. | Malta. | Small Yellow. |
| Breakfast Delight. | Good Traveler. | Mammoth Prolific. Ref. 136. | Smith's Earliest. |
| Buckbee 555. Ref. 100. | Grand View. Refs. 48, 101, 133. | Melbourne Market. | Solomon Giant. |
| Buckner. | Great Combination. Refs. 9, 10, 133. | Melobite. | South Jersey. Refs. 53, 133. |
| California Giant. | Green and Gold. Ref. 133. | Memphis Market. | Star. |
| Cape. | Green Gage. | Mexican Yellow Netted. | Strawberry. Refs. 29, 100, 133, 136. |
| Cape May. Ref. 133. | Green Japan. | Minorca. Refs. 30, 38, 67. | Superb. Refs. 9, 29, 53, 133. |
| Carbonkel. | Growers Pride. Refs. 33, 45, 92, 133. | Moscatoello. Ref. 108. | Sydney Market. |
| Carolina Clark. | Hamilton Market. Ref. 133. | Mountain Top. | Syracuse. Ref. 133. |
| Center Melon. Ref. 3. | Honey Heart. | Nectar of Angels. Refs. 53, 99, 100. | Table Queen. |
| Cincinnati Market. Refs. 53, 133. | Honfleur. Refs. 108, 139. | Netted. Refs. 139, 145. | Texas Belle. Ref. 133. |
| Coral Reef. Ref. 133. | Hoosier King. Syn. Hoosier. Ref. 133. | New Gold. | The Nugget. Ref. 95. |
| Core. | Hoover. | New Green Fleshed. Ref. 53. | Ticonderoga. |
| Corning. | Hope. Ref. 81. | New Hybrid. Refs. 98, 99, 100. | Toledo Early Market. Ref. 133. |
| Cream. Ref. 133. | Hunter. Ref. 3, 106, 138. | New Rival. | Tom Thumb. |
| Cross, Remer's. Ref. 36. | Ice King. | New South. Refs. 40, 97. | Triangle. Ref. 125. |
| Cyprus. Ref. 108. | Idaho Wonder. | New Surprise Gem. | Twenty-day. |
| Dandy. | Iowa Mastodon. Ref. 133. | New Victory. | Ulter. |
| Dee-licious. | Jackson First Market. Ref. 133. | North Dakota. | Vadco. |
| Dickman's Best. Ref. 133. | Jade Beauty. 1935 intr. Rocky Ford Seed Breeders Assoc., Rocky Ford, Colo. | Northern Giant. Ref. 133. | Valpariso. |
| Dominion Day. Ref. 133. | Japan Coral Flesh. Refs. 23, 45, 133. | Onondaga. Ref. 133. | Vasburgh. |
| Dominion Green-fleshed. Ref. 133. | | Our Own. Ref. 133. | Waldorf. Ref. 133. |
| Dunlop. | | Outremont Beauty. | Wayside Market. |
| Early Bristol. Refs. 26, 53, 133. | | Parker's Extra Early. | Wilson's Black. |
| Early Green Japanese. Ref. 108. | | Parks Delight. | Woods Nectar. Ref. 90. |
| Early Hybrid. | | Perfect Beauty. | Woodworth. |
| | | Perfect Gem. Ref. 133. | Yamhill Giant. |

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CHAPTER V

CUCUMBERS

The existence of the cucumber in the New World can be traced to the time of Columbus according to Washington Irving who in his "Life of Columbus" states that he was known to have grown the crop in 1494 on the island of Haiti. This vegetable was later reported by Cartier in 1535 in the vicinity of the present city of Montreal, by the early colonists of Virginia in 1609; and cucumbers are said to be one of the crops destroyed by General Sullivan in 1779 on his raid of destruction through western New York. In 1806 McMahon included a list of 8 cucumber varieties in his Gardeners' Catalogue, *viz.*, Early Short Prickley, Long Green Prickley, White Prickley, Long Green Turkey, Long White Turkey, Smyrna, Roman and White Spined. Practically all of these are mentioned in European literature prior to this time, thus suggesting their old world origin.

Most modern varieties have gradually evolved from the European sorts, either as selections from direct importations or as the result of planned or natural hybridization. Up to 1872 when Tailby's Hybrid was first exhibited, there had been little or no active interest shown towards new sorts. Cucumbers previously listed were for the most part European importations though occasionally improved selections of White Spined and London Long Green were brought to the attention of the growers. From 1880 to the present there has been considerable increase in the number of cucumber varieties. Prior to 1900 such well-known sorts as Arlington White Spine, Everbearing, Cool and Crisp, Evergreen White Spine, Henderson's Perfected, Chicago Pickling and Boston Pickling were developed. The first 10 years of the 20th century saw the introduction of some of our favorite varieties, upon which the modern development of superior varieties is based. In this period Davis Perfect, Early Fortune, Emerald, Klondike and Snow's Pickling were introduced. During the next two decades no less than 22 new sorts were originated including such new varieties as A and C, Adams, Barteldes, Double Yield Pickling, Longfellow, National Pickling and President. The Colorado, introduced in 1934 and Straight-8 listed in 1935 represent two very excellent sorts that have little in common with the cucumbers grown during the time of our early colonization.

From the commercial point of view the American varieties of cucumbers are composed of three classes, based on their use. First, the field grown slicing or table sorts, characterized by the presence, with few exceptions, of white spines, grow to fairly large size, are usually attractive, and retain their green color over a comparatively long period of time. Second, the pickling varieties, also field grown, are almost invariably black-spined and are further characterized by being much smaller than the slicing varieties, much less tapered at the

tip in immature stages, decidedly more productive, and somewhat less retentive of their green color, and do not shrivel during the pickling process. Third, the forcing or greenhouse varieties are obviously those adapted to culture under artificial heat.

DISCUSSION OF CLASSIFICATIONS

Very little has been attempted in classification of cucumber varieties. Although an ancient crop and one which has been given considerable attention by horticultural writers, its treatment has been almost without exception confined to the listing of names or a very brief discussion of varieties. Miller (47) in 1768 mentioned several sorts, namely the Common, Long Turkey and Long White Prickley and Mawe and Abercrombie (46) listed 8 sorts in 1778; later McMahon (38) in 1806 and Lindley (37) in 1831 included short discussions of varieties. Naudin (51) divided the crop into 4 groups, the small Russians, the ordinary Long Greens, the White cucumbers and the cucumbers of Sikkim. Other than a brief description of each type no further division was made. Fearing Burr, Jr. (9) wrote the first comprehensive account of American vegetable varieties in 1863 and, although 55 varieties were discussed, nearly two-thirds belonged to the English forcing group. Vilmorin-Andrieux (78) the French seedsmen published the first edition of "Les Plantes Potageres" in 1856. This work is analagous to Burr's treatise on vegetable varieties and has gone through several editions. Some 30 varieties of cucumbers are discussed in the edition of 1883. No division is made of the Continental types, but under the discussion of Long Green English, 9 or 10 sorts are grouped as most adaptable to forcing. An additional group, ridge cucumbers, those which do fairly well out of doors but better under glass, completes their classification.

In 1887 the first attempt was made to classify cucumber varieties on the basis of morphological characters. After several years trials at this Experiment Station, Goff (19) published an account of 24 varieties, all of which were divided into one of two groups based on color of the fruits when immature, *viz.*, young fruit green and young fruit white or greenish white.

Waugh and Thompson in an article in Bailey's Cyclopedia of Horticulture, 1914, (6) divided all cucumbers into four general groups, *viz.*, the common cucumber, the Sikkim, the Snake and the West India Gherkin. The first group was further divided into the English forcing type and the field sorts, and the latter again classified as to whether the varieties were black-spined or white-spined. Four black-spined variety groups and two white-spined groups were established.

A group classification made by Sturtevant (24), but not published until 1919 included 6 divisions based on

varietal types. These were Early Cluster, Early Frame, Long Green, Long Green English, White Dutch and Early Russian.

The cucumber does not lend itself readily to detailed classification and for obvious reasons no attempt is made in this study to do other than to arrange the varieties alphabetically.

A and C. Syn. Ace.

This variety originated with Abbott & Cobb, Philadelphia, Pa., and was introduced by them in 1928. In their catalog for 1935 the originators say, "This is positively a new stock of cucumber which we are offering and not a renamed variety nor an old variety remodeled." The fruits of this new sort are unusually attractive, uniformly straight and hold the dark color for a long time. They are somewhat like Davis Perfect in general appearance, being about the same length but slightly thicker at the medial, more abruptly tapered towards the apex and more circular in cross-section.

Fruit moderately long and medium plump, 9-10 x 2¼-2½ inches. Shape somewhat fusiform, straight, medial slightly swollen; base gradually tapered; apex abruptly tapered. Cross-section near base circular, at medial and near apex slightly triangular. Color dark green, with rather obscure narrow stripes extending not more than one-quarter the length of the fruit. Tubercles few and indistinct. Spines white. Flesh moderately thick and greenish white in color. Seed mass moderately small and solid.

Abundance. Ref. 42.

The variety Abundance was originated by a gardener near Rochester, New York, and was introduced about 1916. It is primarily a forcing sort, with long, smooth, symmetrical fruits that are quite distinct in the profuse marking of fine yellowish green specks over most of the surface. The fruits are equal in size to those of Davis Perfect, although somewhat shorter than the forcing strain of that variety. They are less tapering at the ends, lighter green in general color and have less prominent tubercles.

Fruit moderately long and moderately slender, 9-10 x 2-2¼ inches. Shape nearly cylindrical, straight, symmetrical; base rounded; apex rounded but occasionally abruptly tapered; ridges obscure. Cross-section near base and medial circular; near apex very slightly triangular. Color dark green, profusely and finely speckled with pale yellowish green specks over most of the surface, particularly at the apex and medial; prominently marked with narrow, pale greenish yellow stripes at the apex which extend about one-quarter the length of the fruit. Tubercles few and obscure, spines white. Flesh thick and greenish white in color. Seed mass small and solid.

Adams.

In 1926 the T. Lee Adams Company of Kansas City, Missouri, introduced the Adams cucumber as a cross between Telegraph and Davis Perfect. The variety has not been widely cataloged, at least under the name Adams, but it is, however, considered to be an outstanding sort. The fruits are most like those of Longfellow in general appearance, although the Adams is 2-3 inches shorter, more uniformly rounded at the ends, more bluish green in color and has larger and more prominent tubercles.

Fruit moderately long and medium plump, 9-10 x 2¼-2½ inches. Shape nearly cylindrical, straight, occasionally somewhat curved; medial even; base and apex rounded. Cross-section at base and apex circular, at medial slightly triangular. Color at the early stages very dark bluish green, later deep, dull green; tip stripes very narrow and inconspicuous, extending less than one-quarter length of fruit. Tubercles many, rather large and prominent. Spines white. Flesh very thick and firm, distinctly white in color. Seed mass very small and solid.

Arlington White Spine. Refs. 3, 12, 13, 14, 16, 20, 21, 22, 34, 35, 39, 48, 49, 56, 57, 58, 61, 64, 75, 79. Syns. Ak-sar-ben, Aldon White Spine, Arlington, Arlington Early White Spine, Arlington Famous White Spine, Arlington Improved, Baltimore White Spine, Bloomsdale Perfected White Spine, Blue Ribbon Improved White Spine, California Gem, Climax, Crystal Springs, Early Perfection White Spine, Early Prolific White Spine, Early Spine, Extra Early Arlington White Spine, Extra Early White Spine, Extra Select White Spine, Famous, Famous White Spine, Ideal White Spine, Improved Arlington, Improved Arlington White Spine, Improved Baltimore White Spine, Improved Early White Spine, Improved Extra Early Arlington White Spine, Improved Extra Early White Spine, Improved White Spine, New Arlington White Spine, Ohio White Spine, Perfected Arlington, Washington White Spine.

The name Arlington was first used about 1886 for a special selection of the White Spine cucumber. W. W. Rawson, one of the pioneer market gardeners of the country, was located at Arlington, Massachusetts, and the forcing of cucumbers in hot beds and cold frames was one of his most successful enterprises. For some years he grew a selection known as Improved White Spine or Rawsons Improved. D. M. Ferry & Co. of Detroit and James J. H. Gregory first called this variety Arlington, although later it became better known as Arlington White Spine.

For many years this was the most widely grown cucumber variety in and about Arlington. Many strains were developed and in due time largely replaced the original. Although the name is still listed today, the stock is inferior to many of the new and improved introductions. The best strains are known as Arlington White Spine Forcing, Bennett's White Spine, Bollwinkle's North Carolina strain, Boston Forcing White Spine, Boston Market Forcing, Breck's White Spine, Dark Green Arlington (Bunting Strain), Early Florida and Florida.

The fruits of Arlington are 4-5 inches shorter than those of Evergreen White Spine, somewhat less plump, and more strongly tapered towards the apex, whereas the skin of Evergreen White Spine is decidedly darker green in color and has much narrower and less prominent tip stripes.

Fruit medium long and moderately plump, 7-7½ x 2½-2¾ inches. Shape unevenly fusiform, straight and symmetrical, strongly tapered towards apex, abruptly tapered to nearly rounded at the base. Cross-section nearly circular at base, distinctly triangular at medial and near apex. Color medium to moderately light green, marked with broad, prominent tip stripes which extend



EARLY FORTUNE



ARLINGTON WHITE SPINE

(Natural size)



EARLY CYCLONE (upper)

CUMBERLAND

Natural size

for one-third or more the length of the fruit. Tubercles few, rather obscure. Spines white. Flesh medium thick to moderately thin, greenish white in color. Seed mass large and rather loose.

Barteldes. Ref. 22.

The Barteldes cucumber which was given an Award of Merit in the All America vegetable selections for 1934 was introduced in 1925 by Barteldes Seed Co., Lawrence, Kansas. It was introduced as a very dark green shipping cucumber and in the middle western states is considered a superior variety. The fruits are much like those of Longfellow, but are slightly plumper, more uniformly rounded at the ends, slightly less warty and distinctly more speckled with yellowish green; and the flesh whiter.

Fruit long and moderately plump, 10-12 x 2½-3 inches. Shape nearly cylindrical, straight, medial very slightly swollen, rounded at the base and apex. Surface very smooth even at the pickling stages. Cross-section circular in all parts. Color very dark green, speckled over the entire surface with pale yellowish green specks; tip stripes rather narrow and obscure, extending not more than one-quarter the length of the fruit. Tubercles very few, practically absent. Spines white. Flesh thick and white in color. Seed mass small and solid.

Boston Pickling. Refs. 3, 11, 12, 13, 14, 17, 18, 19, 21, 29, 48, 49, 52, 53, 56, 57, 58, 60, 62, 63, 64, 65, 75, 79, 81, 82. Syns. Boston Pickle, Early Green Prolific, Extra Early Green Prolific, Extra Early Prolific, Extra Green Prolific Pickling, Extra Long Green Prolific, Green Prolific, Green Prolific Pickling, Improved Extra Early Green Prolific, Short Green Pickling, Short Pickling, Short Prolific, Short Prolific Pickle, Short Prolific Pickling.

The name Boston Pickling seems to have been first used about 1880. In the 1885 catalog of W. W. Rawson & Co. of Boston, the variety is listed as Boston Pickling (True Lincoln stock) (American Gherkin). The origin is unknown. Present day stocks are considered to be darker green than most pickling sorts, are more slender and lack the thickened base or shoulder present in Chicago Pickling.

Fruit moderately short and medium plump, 6-7 x 2¼-2½ inches. Shape long oval, nearly cylindrical, straight, medial slightly swollen, base and apex rounded. Cross-section circular near base, triangular at medial and apex. Color moderately dark green, tinted lighter at extreme apex; tip stripes rather prominent, extend one-half the length of fruit. Tubercles moderately many but not very prominent. Spines black. Flesh moderately thin and very white in color. Seed mass moderately large, and has small triangular cavity.

Pickles unevenly fusiform, with taper towards apex much longer than that towards base; moderately dark green in color, slightly lighter at extreme apex.

Capitol.

Luther Burbank crossed the Lemon cucumber with Burpee's Long Snow-White and secured a new form which he listed as Iceland in 1917. In his catalog for 1923, another selection, Capitol, "with fruits exactly like Iceland in every respect except color which is bright green"

was introduced. This was apparently a segregate of the second generation from the same cross. Stocks grown at Geneva have shown this variety to be much like Lemon in size and form, but green in skin color. Apparently little publicity was given this sort, for it is not listed in other seedsmen's catalogs.

Chicago Pickling. Refs. 3, 6, 13, 20, 21, 22, 29, 48, 49, 57, 61, 63, 64, 66, 75, 79. Syns. Improved Chicago Pickle, Westerfield, Westerfield Chicago Pickling, Westerfield Pickling.

This variety was first listed in 1888 by D. M. Ferry & Co. of Detroit, Michigan. It was probably developed in the vicinity of Chicago as it has been a favorite in that section for many years. Vaughan Seed Store of Chicago in 1897 introduced a very excellent strain which they named the Westerfield Chicago Pickle for a gardener who made special selections for the pickle trade. This is one of the four leading sorts grown in most of the pickle growing regions. The fruits are somewhat lighter green than Boston Pickling and have a more prominent and distinctly rounded base or shoulder. It is especially well adapted for use as dill pickles.

Fruit short and moderately slender, 5-6 x 2-2¼ inches. Shape unevenly fusiform, abruptly tapered at base, gradually tapered towards apex, slightly swollen near medial. Cross-section circular at base, distinctly triangular at medial and apex. Color medium green, tinted with yellow at the apex and rather prominently striped for one-half the length of the fruit. Tubercles moderately prominent. Spines black. Flesh moderately thin, greenish white in color. Seed mass moderately large and solid.

Pickles distinctly tapered from base to apex; base large, rounded. Color moderately dark green, considerably lighter at medial and apex.

China Long. Refs. 3, 4, 6, 16, 17, 19, 22, 57, 58, 64, 75, 79. Syns. Chicago Giant, China, Chinese, Chinese Evergreen, Chinese Long Green, Early Chinese, Great Giant, Jumbo, Long China, Long Green China, Long Green Chinese, Shumway's Giant, Very Long Green Chinese.

The names given above and those listed under the variety name Chinese Three Feet represent a form which differs noticeably in both fruit and foliage from the so-called American cucumbers. As early as 1862 in the catalog of James Vick's Seeds, Rochester, New York, we find the variety name Chinese Long Green, and over thirty-two years later the name Chinese Long Remaining Green was noted in the catalog of Henry Dreer of Philadelphia. The type was listed as "China" in 1921 by Harris, and later by Burrell, Henderson, Burgess and others. Inasmuch as the variety has not been considered as a standard commercial sort, but more as a novelty, there has been some mixture of stocks. The descriptions given below and under Chinese Three Feet represent two distinct types. The variety names associated with them have not always been consistent, and further trial will be necessary to establish more exactly the synonymy of the two varieties. The fruits of this type are considerably shorter than Chinese Three Feet, distinctly more angular in cross-section, darker green in skin color and distinctly more warted.

Plant very vigorous and coarse, spread 5-6 feet or more, leaves very large, 9-10 x 9-10 inches, very dark green, profusely wrinkled and crumpled with distinct serrate margins; tendrils very long and well developed.

Fruit very long and moderately plump, 12-14 x $2\frac{1}{2}$ - $2\frac{3}{4}$ inches; symmetrical, straight, rounded at the base and apex and rather prominently ridged. Cross-section distinctly triangular or occasionally nearly quadrangular. Color medium to dark green, finely speckled with pale yellow over the entire surface, particularly along the depressions; tip stripes narrow, not very prominent and extending about one-third the length of fruit. Tubercles very prominent, large, almost wart-like. Spines long and white. Flesh moderately thick, decidedly greenish white in color. Seed mass medium large with triangular cavity in center.

Chinese Three Feet. Refs. 20, 75. Syns. Chinese Long-Remaining Green, Chinese Snake, Climbing, Climbing China, Japan Dark Green Cuc, Japanese Dark Green.

The catalog of Dupuy and Ferguson of Montreal, Canada, for the year 1933 lists the variety Chinese Three Feet and also Chinese Long Green. As previously noted under the variety China Long, there are several names for these two varieties which have been used interchangeably and the description given below represents the variety producing the longer and smoother fruits of the two. It is somewhat like the English Forcing cucumbers, although it is more prickly and somewhat darker and more glossy green in color.

Fruit very long and slender, 18-24 x $1\frac{3}{4}$ -2 inches. Shape cylindrical (when grown on the ground, it usually coils somewhat); base tapered, usually constricted; apex sharply tapered to pointed; ridges obscure. Cross-section circular at base and medial, slightly triangular at apex. Color light green, profusely speckled with pale yellowish green over the entire surface except over the moderately dark green, narrow, irregular stripes along the medial; tip stripes obscure, one-eighth or less the length of the fruit. Tubercles few and obscure. Spines white. Flesh moderately thin, distinctly greenish white, often slightly bitter. Seed mass moderately large and solid, contains very few and small seeds.

Clark's Special. Ref. 22. Syns. Imperator, Lago Nu-green.

This introduction of the Associated Seed Growers, Inc., New Haven, Connecticut, received an award of Merit in the 1932 All-America trials. The variety has shown considerable promise as a shipping and market sort. In general appearance it is most like Davis Perfect, although the fruits are more plump, more abruptly tapered at the ends, and have fewer but somewhat more prominent tubercles.

Fruit moderately long and moderately plump, 9-10 x $2\frac{1}{2}$ -3 inches. Shape nearly cylindrical, slightly to abruptly tapered at the base, sides nearly parallel at the medial, and abruptly tapered to rounded at the apex. Cross-section, base circular, apex and medial moderately triangular. Color dark green tinted with pale yellow near the apex; tip stripes rather broad, often rather obscure, extending one-quarter the length of the fruit. Tubercles moderately few, large and prominent. Spines white. Flesh thick and greenish white in color. Seed mass moderately small and solid.

Colorado.

This new and attractive variety originated with the J. C. Robinson Seed Co., Waterloo, Nebraska, was introduced in 1934 and received an award of merit in the 1935 All-America trials. It is similar in shape to the Vaughan but differs from that variety in being 3-5 inches

shorter, more slender and somewhat less prominently warted.

Fruit long and moderately slender, 9-12 x $2-2\frac{1}{4}$ inches. Shape cylindrical, straight; base sharply tapered, apex rounded, medial even. Cross-section circular at all portions. Color dark green, with tip stripes narrow, greenish white in color and extending considerably less than one-quarter the length of the fruit. Tubercles few, slightly prominent. Spines white. Flesh moderately thick and greenish white in color. Seed mass moderately small and solid.

Common Rough Green Pickling. Ref. 46.

This is one of the seven varieties mentioned by Mawe & Abercrombie in 1778. According to the description then published it was a "Middle sized fruit about 6 or 7 inches long, having a dark green, rough rind, closely set with very small prickles; the plant is of the hardest sort, bears plentifully in summer, but does not show fruit early, so is not proper for frames."

Cool and Crisp. Refs. 6, 12, 13, 57, 61, 64, 75. Syn. Crisp and Cool.

Henderson's Cool and Crisp was introduced by Peter Henderson & Co. in 1893 and in most trial ground reports was described as a "strain of White Spine somewhat like the Arlington but longer and more cylindrical." According to the introducer the variety was primarily a pickling sort but also most useful for slicing. The variety is in existence today and while not the most popular sort it is early, prolific and desirable.

Fruit medium long and moderately slender, 7-8 x $2-2\frac{1}{4}$ inches. Shape somewhat fusiform, long taper towards base, slightly swollen at the medial and slightly tapered toward apex. Cross-section slightly triangular at medial and apex, nearly circular at base. Color dark green, tinted yellowish green near apex; tip stripes rather prominent, extend one-third the length of the fruit. Tubercles medium in number, large, prominent. Spines white. Flesh medium thick, greenish white in color. Seed mass medium large, solid.

Crystal Apple.

This cucumber was listed by Arthur Yates & Co. of Sydney, Australia, in 1933. Ferry Morse Seed Co. of Detroit listed it in 1934 and showed a very excellent illustration of the white apple-shaped fruits. For many years the Apple Shaped or Lemon cucumber has been very popular in Australia and as a prolific and sweet flavored sort has come forward both as a home garden and market cucumber. This new white variety is similar to the Lemon cucumber in shape and size but is distinctly lighter in color.

Cumberland. Refs. 13, 57, 75. Syn. New Cumberland.

The Cumberland, offered by Henry A. Dreer and W. Atlee Burpee of Philadelphia in 1902, was originated by Chauncey P. Coy & Sons, Nebraska, and was considered by Mr. Coy to have been one of his best productions. The new variety resulted from a cross between Parisian Pickle and Peerless White Spine and was offered after eight years of careful selection work. The successful combination of these two quite different varieties made an ideal sort for table use and for pickling. When the fruits are small they are covered with fine hair-like spines in which respect they resemble Danish and Parisian Pickling. The variety is little used today.



CUMBERLAND



IRISH QUEEN

(Natural size)



EARLY FRAME



NOROTON SELECT WHITE SPINE

(Natural size)

Fruit medium long and moderately slender, 7-8 x 2-2 $\frac{1}{4}$ inches. Shape partially cylindrical, straight; base moderately tapered; medial slightly swollen; apex rounded; surface very rough and bumpy, uneven, finely ridged. Cross-section triangular at all portions. Color medium green, profusely speckled with yellowish green over most of the surface; tip stripes obscure and extend one-quarter or less the length of the fruit. Tubercles very many, small, pimple-like. Spines white, exceedingly numerous, hair-like. Flesh medium thick, decidedly greenish white in color. Seed mass moderately small, solid.

Danish Pickling. Ref. 57.

This is a comparatively new variety which was introduced in 1912 by L. Daehnfeldt of Odense, Denmark, and first offered in this country in 1915 by Meyer-Stisser of Baltimore. The variety produces fruits which are extremely large and long and thickly covered with fine spines. The variety is early and prolific and produces fruits over a long season. It most resembles Cumberland especially in respect to the degree of spini-ness. However, it is decidedly longer and more slender than that variety.

Fruit very long and moderately plump, 12-15 x 2 $\frac{1}{2}$ -3 inches. Shape nearly cylindrical, usually straight, moderately symmetrical; base rounded, often slightly constricted; apex rounded; ridges obscure. Cross-section circular in all portions. Color dull, dark green, obscurely striped at the apex one-third the length of the fruit, often speckled with greenish yellow. Tubercles very numerous, small, pimple-like, prominent. Spines white, very numerous, fine, hair-like. Flesh medium thick, very fine texture, white in color, rather tart. Seed mass small and solid, with few seeds formed.

Pickles long and slender, cylindrical, rounded at the base, abruptly tapered at the apex; ridge obscure. Color very dark green, uniformly distributed. Tubercles very numerous. Flesh greenish white, firm.

Davis Perfect. Refs. 6, 22, 29, 39, 40, 42, 43, 57, 59. Syns. Challenge, Davis Perfection, Davis Perfect "Select," Perfected Davis Perfect, 20th Century, Vadco Wonder.

When introduced in 1906 by Alfred J. Brown Seed Co., Grand Rapids, Michigan and Wm. Henry Maule of Philadelphia, the Davis Perfect cucumber was called the "most sensational vegetable novelty of the year." Eugene Davis of Grand Rapids who had originated the Davis Wax bean and Grand Rapids lettuce was also the originator of this new cucumber. For many years it was the most popular of the shipping varieties due to its deep green color and the long smooth fruits with pointed ends. Strains are available which are suitable for both outdoor and indoor culture. It is slightly longer than Early Fortune, more uniformly fusiform, more triangular in cross-section and has more prominent tubercles.

Fruit moderately long and moderately slender, 9-10 x 2-2 $\frac{1}{4}$ inches. Shape fusiform, symmetrical, straight; base and apex long tapering; medial swollen; ridges rather prominent; cross-section slightly triangular at base and medial, more distinct at apex. Color dark green, rather prominently marked with narrow stripes at the apex for one-quarter the length of the fruit. Tubercles many, rather prominent. Spines white. Flesh moderately thick, greenish white in color. Seed mass small, solid.

Deltus. Refs. 22, 29, 44, 45.

The Deltus cucumber originated on the farm of Adelbert Titus of Irondequoit, a market garden center near Rochester, New York. It was developed in much

the same way as the Davis Perfect and with the same object in view, namely the production and development of a cucumber perfect in appearance and suitable to greenhouse conditions. Hart & Vick, Inc., of Rochester, were the introducers in 1919. The fruits are somewhat slender and distinctly less tapering at the ends than are those of Davis Perfect, while the tubercles and tip stripes are much less prominent.

Fruit moderately long and medium plump, 9-10 x 2 $\frac{1}{4}$ -2 $\frac{1}{2}$ inches. Shape cylindrical, straight, slightly swollen at the medial; base rounded to slightly tapering, apex abruptly tapered, ridges obscure. Cross-section circular at base, nearly circular at medial and apex. Color dark green, obscurely marked with very narrow greenish yellow stripes at the apex which extend one-quarter or usually much less than the length of the fruit. Tubercles few and obscure. Spines white, few. Flesh thick, greenish white in color, very fine texture. Seed mass small and solid.

Double Yield Pickle. Ref. 22.

Joseph Harris Co., Coldwater, New York, introduced Double Yield Pickle in 1924. The variety was secured from a gardener who had been selecting and perfecting his own strain for many years. In the words of the introducer, "The remarkable thing about this new cucumber is its wonderful productiveness. For every pickle that is cut off two or three more are produced." Double Yield is one of the earliest cucumbers with which we are acquainted. It is distinct as a pickling sort, being longer in proportion to its thickness than any but Jersey Pickling and is much more symmetrical, smoother and more uniformly and abruptly rounded at the ends than any other. It is, however, somewhat lighter in color, particularly at the medial and apex, than are the commonly used pickling varieties of today.

Fruit short and slender, 5-6 x 1 $\frac{7}{8}$ -2 inches. Shape cylindrical, straight and symmetrical; base slightly tapering; slightly swollen near base, rounded at apex; ridges obscure. Cross-sections circular in all portions. Color medium green, tinted greenish white near apex; tip stripes narrow, rather prominent and extend one-quarter the length of the fruit. Tubercles practically absent. Spines black, very few. Flesh moderately thick, greenish white in color. Seed mass moderately small and solid.

Pickle, long oval, very symmetrical, distinctly rounded at base and apex; ridge obscure. Cross-section very slightly triangular at medial and apex. Color medium green at the base and part of medial, remainder moderately light green. Tubercles few.

Earliest of All. Refs. 22, 57, 75. Syns. Burrell's Earliest of All, Earliest White Spine, First Crop, First of All, Forty Day, Mill's Earliest.

The name by which this variety is known is reasonably correct in describing its seasonal maturity. It is one of the perfected White Spine selections and has been known for nearly forty years. S. M. Isbell & Co., Jackson, Michigan, and D. V. Burrell of Rocky Ford, Colorado, both were featuring it by 1906. The illustration in the 1909 catalog of D. V. Burrell shows the fruits to be quite blocky in appearance and shorter than Arlington White Spine. At Geneva this variety was about as long as Early Frame and very much like it in shape, being somewhat less convex at the medial, and having fewer and less prominent tubercles and white instead of black spines.

Fruit moderately short and medium plump, $6\frac{1}{2}$ -7 x $2\frac{1}{4}$ - $2\frac{1}{2}$ inches. Shape short oval, straight; base rounded, medial slightly swollen; apex rounded. Cross-section circular at the base, triangular at medial and near apex. Color moderately dark green, tinted with yellowish white at apex; tip stripes medium prominent and extend one-quarter to one-third the length of fruit. Tubercles few and obscure. Spines white. Flesh medium thick, crisp and greenish white in color. Seed mass medium large, with distinct cavity at center.

Early Beauty. Refs. 41, 43, 52, 75. Syns. Early Express, Express Extra Early, Tempey's Express Pickler.

This was first offered by John Lewis Childs, Floral Park, New York, in 1899 as a sport from Siberian. In 1902 the Iowa Seed Co. introduced Early Express which had originated with C. P. Coy. The two varieties seem to have been quite similar if the descriptions in the catalogs are correct. (Some years later De Giorgi of Council Bluffs, Iowa, offered a new sort which he called Early Express, but which apparently differed from the earlier variety of the same name.)

Early Beauty was about the same size as Early Frame, somewhat less triangular in cross-section, lighter green in color, and was white-spined instead of black.

Fruit moderately short and moderately slender, 6-7 x 2- $2\frac{1}{4}$ inches. Shape oval, straight, symmetrical; base and apex rounded, medial even to very slightly swollen. Cross-section circular at base, and slightly triangular at medial and apex. Color medium bright green, gradually blending into nearly white at apex; tip stripes moderately broad and prominent, extending one-third to one-half the length of the fruit. Spines white.

Early Cluster. Refs. 3, 6, 7, 8, 9, 15, 18, 19, 21, 25, 46, 48, 49, 50, 53, 56, 57, 58, 62, 65, 72, 75, 79, 80, 82. Syns. Cluster, Early Cluster Prickley, Early Green Cluster, Green Cluster, Improved Early Green Cluster, Table Queen.

This type is one of the oldest of all cultivated cucumbers. It is mentioned in all of the old lists, that of Mawe and Abercrombie in 1778; McMahon, 1806; Fessenden, 1828; Bridgemen, 1857; and Burr in 1863. The latter in describing it says, "A very popular early cucumber producing fruit in clusters near the root of the plant." Goff (19) writing in 1887 says "In the true Early Cluster, the fruits are literally produced in clusters, three or more appearing at the same node; but judging from the samples tested, this quality seems to have been largely lost." The name Early Green Cluster seems to have been used at first but Early Cluster has been the accepted name during the last century.

Fruit short and medium plump, 5-6 x $2\frac{1}{4}$ - $2\frac{1}{2}$ inches. Shape oblong angular, straight; base rounded and full; medial slightly swollen; apex rounded. Cross-section slightly triangular at base and distinctly triangular at medial and apex; color rather light green, tinted with pale yellowish white at apex; tip stripes narrow, rather prominent, greenish yellow in color and extend one-quarter to one-third the length of the fruit. Tubercles many, moderately prominent. Spines black. Flesh thin, rather tough, white with very slight tinge of green. Seed mass very large and solid.

Pickles rounded at the base, even at medial and slightly tapering at the apex; cross-section distinctly triangular; color rather light green, distinctly light at apex.

Early Cyclone. Refs. 57, 75. Syns. Cyclone, White Cluster.

Early Cyclone originated with Chauncey P. Coy of Waterloo, Nebraska, and was introduced in 1900 by Johnson & Stokes of Philadelphia. The name Cyclone was used to indicate the rapid growing tendency of the variety and in this respect it resembled Earliest of All. The fruits were about as long as those of Early Russian, but differed from that variety in being slightly more plump, smoother, white spined, and in having whiter flesh and a less solid seed mass.

Fruit very short and medium plump, $3\frac{1}{2}$ -4 x $2\frac{1}{4}$ - $2\frac{1}{2}$ inches. Shape short oval, straight; slightly larger at rounded base, even at medial, and very slightly tapering to a rounded apex. Cross-section circular at base, slightly triangular at medial and apex. Color medium green, tinted greenish white at apex and rather prominently marked with narrow, greenish white tip stripes which extend one-third or more the length of the fruit; as fruit approaches maturity it becomes nearly white. Tubercles few, small, not very prominent. Spines white. Flesh moderately thin, white in color. Seed mass large, with triangular cavity present at center.

Early Fortune. Refs. 22, 57. Syn. Special Dark Green.

The name Early Fortune was first used sometime previous to 1906 by J. Bolgiano & Son of Baltimore. The name was applied to a selection described as "the earliest and best White Spine Cucumber ever offered." Another strain which also received the name Early Fortune was selected by George Starr at Royal Oak, Michigan, in 1906 from a single plant found in a crop of Davis Perfect. This became the parent stock for the Early Fortune introduced by Jerome B. Rice Seed Co., Cambridge, New York, about 1910, and has continued to represent the type as known today.

The fruits of Early Fortune are slightly shorter than those of Davis Perfect, much more abruptly tapered to rounded at the base, more circular in cross-section and have less prominent tubercles.

Fruits medium long and moderately slender, 8-9 x 2- $2\frac{1}{4}$ inches. Shape unevenly fusiform, very slightly tapering to rounded at the base; medial slightly swollen; apex long tapered. Cross-section circular at base and medial, slightly triangular at apex. Color dark green, rather prominently marked with narrow greenish yellow stripes at the apex, which extend one-quarter to one-third the length of the fruit. Tubercles moderately many, rather obscure. Spines white. Flesh medium thick, crisp and nearly white in color. Seed mass medium large and solid.

Early Frame. Refs. 3, 6, 7, 9, 12, 13, 15, 18, 19, 21, 25, 50, 55, 56, 57, 58, 70, 72, 75, 79, 80. Syns.

Early Frame Short Green, Early Prolific Short Green, Early Short Green, Early Short Prolific, Extra Early Frame, Short Green.

As one of the earliest maturing sorts this variety has been grown in American gardens at least since 1806 at which time McMahon included it in his Gardeners' Catalog. About the middle of the 19th century the name Short Green became associated with the type, and, although at the time was considered distinct by some, the two were soon cataloged as synonymous. Short Green Prickley may have been the prototype from which Early Frame or Short Green evolved. The fruits of Short



EXTRA LONG WHITE SPINE (upper)

WINDSOR PICKLING

Natural size



CAPITAL

LEMON

(Three-fourths natural size)

Green Prickley were, however, consistently shorter and distinctly smoother skinned. Present day stocks of Early Frame are similar to Early Cluster. The fruits are 1-2 inches shorter, more tri-angular in cross-section and considerably darker green in color.

Fruit moderately short and medium plump, 6-7 x $2\frac{1}{4}$ - $2\frac{1}{2}$ inches. Shape short oval, straight; base rounded, slightly smaller at medial, tapering to a rounded apex; depressions marked. Cross-section moderately circular at base, triangular at medial and apex. Color moderately dark green, tinted greenish white at apex; tip stripes prominent, extending one-third to one-half the length of the fruit. Tubercles moderately few, prominent. Spines black. Flesh medium thick, greenish white in color. Seed mass medium large with small triangular cavity at center. Mature fruits deep russet and often slightly netted.

Early Russian. Refs. 3, 8, 9, 12, 16, 18, 19, 21, 53, 56, 57, 58, 62, 64, 72, 73, 75, 82. Syns. Borowskian, Early Russian Gherkin, Extra Early Russian, Improved Early Russian, Muromian, Muromian Gherkin, Russian, Russian Gherkin, Russian Shortish Green, Russian Small Early Pickling, Small Early Russian.

The United States Patent Office Report for 1854 states that Early Russian was "recently introduced from Europe." This agrees with lists which were in use at that time (Hovey & Co., 1859) and also with Burr who in 1863 wrote: This comparatively new variety resembles, in some respects, the Early Cluster. J. C. Robinson Co. say, "Early Russian is the smallest cucumber we grow, extremely early and amazingly productive. It is of little use except for small uniform pickles, but in districts where the late maturing kinds will not ripen this cucumber is popular."

Fruit very short and slender, $3\frac{1}{2}$ -4 x $1\frac{3}{4}$ -2 inches. Shape cylindrical, straight, very short oval; base and apex rounded; medial even. Cross-section nearly circular at the base, and slightly triangular at the medial and apex. Color moderately light green, tinted with yellowish white at the apex; tip stripes moderately narrow, prominent, and extend one-third the length of the fruit. Tubercles moderately many, rather obscure. Spines black. Flesh thin, fine texture, greenish white in color. Seed mass large, solid.

Pickles short oval, almost cylindrical; base rounded, apex abruptly tapered; ridges obscure, depressions absent. Cross-section nearly circular. Color light green, uniformly distributed.

Early Short Prickley. Refs. 7, 9, 15, 46. Syns. Early Short Green Prickley, Short Prickley, Short Green Prickley.

The variety name Short Green Prickley occurs in Mawe and Abercrombie, 1778, with a short description as follows: "A short fruit three or four inches long, the rind rather smooth and set with small black prickles; is valuable principally for being one of the hardiest and early sorts." This description agrees with the many that were published in trade lists during the next century.

Early Short White Prickley was considered a white-spined strain of Early Short Prickley.

Early White. Refs. 19, 58, 73.

Early White was described in the New York Agricultural Experiment Station Annual report for 1887. There were many introductions of white cucumbers, and

whether this particular one became the foundation stock for some of the later well-known white sorts is not known.

Fruit medium long and moderately plump, 8-9 x $2\frac{1}{2}$ -3 inches. Shape oblong cylindrical, straight. Cross-section somewhat triangular. Color greenish white, becoming almost pure white at full maturity. Spines white.

Early White Spine. Refs. 3, 8, 12, 13, 15, 16, 17, 18, 19, 21, 25, 29, 34, 35, 39, 48, 55, 57, 59, 61, 62, 72, 73, 75, 79, 80, 81. Syns. Chicago, Extraordinary White Spine, Famous Peerless, Monarch, Monarch White Spine, Peerless, Peerless Improved White Spine, Peerless White Spine, Prolific White Spine, Special White Spine, Success, Unexcelled White Spine, White Spine.

The earliest names used for cucumbers seem to have been chosen for their descriptive value. The spines on the fruits attracted attention and among the very earliest names used were Short Prickley, Long Green Prickley and White Spined (McMahon 1806). Some years later the name White Spine, (Thorburn, 1824, Hovey, 1834) was used. At first White Spine undoubtedly referred to a rather definite type. Later the term White Spine was used in conjunction with other names as Early White Spine, Arlington White Spine, Prolific White Spine, etc. White Spine, used alone, disappeared, and the name Early White Spine came to be used to designate the variety.

Arlington White Spine became even better known than Early White Spine but represented a somewhat different type. A number of carefully selected strains of Early White Spine were offered from time to time. The better known of these were Early Forcing White Spine and Forcing White Spine.

Fruit medium long and medium plump, 7-8 x $2\frac{1}{4}$ - $2\frac{3}{4}$ inches. Shape somewhat cylindrical, straight; base rounded, medial slightly swollen, apex abruptly tapered to rounded. Cross-section nearly circular at base, triangular at medial and apex. Color light green, tinted greenish white at apex; tip stripes moderately broad, rather prominent, extending one-third or more the length of the fruit. Tubercles moderately few, rather obscure. Spines white. Flesh medium thick, greenish white in color.

Mature fruits lose color rapidly and become greenish white to almost clear white at full maturity.

Early Yellow Dutch. Refs. 16, 19, 58.

This is a continental type which was described by Vilmorin and grown in the Geneva trials from 1884 to 1887. It was of little if any significance to American gardeners, and was supposed to be larger and later than Early Russian and apparently well adapted for forcing in Europe.

Fruit medium long and medium plump, 8-9 x $2\frac{1}{2}$ -3 inches. Shape oblong oval to cylindrical, rather uneven, often curved, slightly furrowed. Cross-section slightly triangular except at the base. Color greenish white, which at full maturity becomes rich yellow to orange. Tubercles moderately many, rather prominent. Spines black. Flesh thick, greenish white in color, crisp.

Emerald. Refs. 3, 20, 57, 61, 65, 75. Syns. Emerald Green White Spine, Florida Emerald, Florida Green.

The factor of desirable and long-holding color has been one of great concern to cucumber growers. One

of the first attempts to improve this condition was initiated by the A. W. Livingston's Sons Seed Company in 1889 when a desirable seedling of White Spine was noticed. In 1897, after 7 years selection work, Livingston introduced the variety, Emerald. This variety continued as a leading sort for many years and undoubtedly was a contributory factor in the development of superior darker green cucumbers. It has not been listed within recent years.

The fruits were slightly longer than Arlington White Spine, more nearly cylindrical, distinctly smoother skinned and decidedly darker green than any other sort then in existence. In comparison to present day Kirby it was 2-3 inches shorter, slightly more circular in cross-section and much like it in color.

Fruit moderately short and medium plump, 6-7 x 2¼-2½ inches. Shape cylindrical, straight, symmetrical; base and apex rounded, medial even. Cross-section circular at all portions. Color very dark green almost blue green, obscurely marked at apex with very short and narrow, dark greenish yellow stripes. Tubercles absent. Spines white, very sparse. Surface very smooth. Flesh thick, nearly white in color. Seed mass moderately small and solid.

Everbearing. Refs. 6, 11, 12, 20, 21, 22, 52, 57, 61, 62, 63, 64, 75, 79. Syns. Earliest Everbearing, New Everbearing, Thorburn Everbearing, Thorburn's New Everbearing.

This unique variety was developed about 1888 by J. M. Thorburn and Co., and introduced one or two years later. Nothing is known concerning its origin but its similarity to Early Russian and Siberian leads one to suspect its relation to these or similar sorts. During the early years of its popularity it was acknowledged to be very early and exceedingly productive as evidenced by the statement "The vines continued to flower and produce fruit until killed by frost, whether the ripe cucumbers are picked off or not." This so-called everbearing habit has apparently been lost, for the stocks purchased during the last 8 or 10 years fail to demonstrate this characteristic.

The fruits of Everbearing were 1-1½ inches longer than those of Early Russian and slightly more plump. The color of the two was very similar, but the tubercles were more numerous and prominent on Everbearing.

Fruit short and moderately slender, 4½-5 x 2-2¼ inches. Shape nearly cylindrical, straight; base rounded; medial slightly swollen; apex rounded. Cross-section circular at the base and moderately triangular at medial and apex. Color medium to rather light green, tinted with yellowish white at the apex; tip stripes prominent and extend one-third the length of the fruit. Tubercles many, rather prominent. Spines black. Flesh thin, rather yellowish white in color. Seed mass moderately large, with slight cavity in center.

Pickles short oval; base rounded, apex distinctly tapered with ridge and depressions rather marked. Cross-section distinctly triangular. Color light green, tinted white near tip. Flesh greenish white in color.

Evergreen White Spine. Refs. 3, 4, 12, 18, 19, 21, 22, 29, 39, 42, 48, 56, 57, 58, 61, 64, 75, 79. Syns. Century, Early Evergreen, Early Long White Spine, Evergreen, Evergreen Early White Spine, Extra Early Evergreen White Spine, Extra Long,

Extra Long Evergreen, Extra Long White Spine, Improved Early Long White Spine, Long Evergreen White Spine, New Century, New Evergreen, New Evergreen White Spine, New York Extra Long Perfected White Spine, Pride of the Pacific, Toledo Market Evergreen White Spine, White Oak.

One undesirable characteristic of the old White Spine was its poor color and its inability to hold the green very long after it had attained prime slicing stage. Various selections were made to obtain this desirable character, among which was one selected by Johnson and Stokes of Philadelphia, Pennsylvania, and introduced as Evergreen White Spine in 1886. Continued selections have resulted in one of our longest and most desirably colored varieties. The fruits are 4-5 inches longer than those of Arlington White Spine, much more cylindrical and distinctly darker green in color with much narrower and less prominent tip stripes.

Fruit long and moderately plump, 10-12 x 2½-3 inches. Shape somewhat cylindrical, straight; base and apex moderately tapered, medial slightly swollen. Cross-section circular at the base and nearly so at medial and apex. Color dark green, retained well, tinted pale greenish yellow at extreme apex; tip stripes narrow, moderately prominent and extend one-quarter to one-third the length of the fruit. Tubercles few but rather prominent. Spines white. Flesh thick, very crisp and greenish white in color. Seed mass moderately smooth with small triangular cavity usually present.

Fojin. Syns. Mandarin, New Early Fojin, Quality.

Dr. Yami Kin sent several varieties and strains of Chinese cucumbers to the Vaughan Seed Store some years ago. After making crosses with white-spined sorts and selecting the most desirable types for several years, the best was introduced to the trade in 1932 by Vaughan as Fojin. This was subsequently changed to Mandarin.

The fruits are 3-4 inches shorter than those of Improved Long Green, more curved and distinctly more uniformly circular in cross-section. The color is much like that of Chinese Three Feet, although the skin surface is more warted than in that variety.

Fruit medium long and slender, 8-9 x 1¾-2 inches. Shape oblong, slightly curved; base rounded, medial even but often slightly compressed, apex abruptly tapered. Cross-section circular at all portions. Color medium dark green, covered with yellowish green speckles over the entire surface; tip stripes not very prominent, narrow and extend about one-quarter the length of the fruit. Tubercles few, moderately prominent. Spines white. Flesh rather thin, white in color. Seed mass large, solid.

Fordhook Famous. Refs. 6, 43, 57, 75. Syns. Early Fordhook White Spine, Fordhook Fancy, Fordhook White Spine, Imperial.

The origin of this variety is attributed to Mr. A. McInnis, an experienced Scotch seed grower of Ontario, Canada. He crossed White Spine with Noa's Forcing about 1894 and after several years selection sold his entire crop to W. Atlee Burpee of Philadelphia, Pa., who introduced it to the American trade in 1902.

This is one of the largest of the White Spine sorts, being fully as long as Evergreen White Spine, more triangular in cross-section, not quite as dark in color



NATIONAL PICKLE



BOSTON PICKLING



SNOW'S PICKLING



PARISIAN PICKLE (upper)

PERFECTED PICKLE

(Natural size)

but less prominently striped and with a greater number of slightly more prominent tubercles.

Fruit long and moderately plump, 10-12 x $2\frac{1}{2}$ -3 inches. Shape much elongated, straight; base rounded, medial slightly swollen and apex tapering; ridges and depressions rather marked. Cross-section nearly circular at the base, and triangular at medial and apex. Color medium to light green tinted with greenish white at the apex; tip stripes narrow, rather obscure and extend one-quarter or less the length of the fruit. Tubercles many, prominent. Spines white. Flesh thick, greenish white in color. Seed mass moderately small, solid.

Fordhook Pickling. Refs. 57, 61, 75. Syns. Fordhook, New Fordhook Pickling.

In 1897 W. Atlee Burpee introduced this pickling sort as an important acquisition to the cucumber pickle industry. It originated with C. P. Coy of Nebraska, who reported it to be the result of a cross between a European sort and Cool and Crisp. After seven years selection to attain uniformity it was sent to Burpee in 1896.

As grown at Geneva it was one of the longest of the pickling sorts, being as long as Jersey Pickling, slightly more plump, and distinctly more constricted near the basal end. The small pickles were more fusiform and usually slightly darker green, particularly at the base.

Fruit medium long and medium plump, 7-8 x $2\frac{1}{4}$ - $2\frac{1}{2}$ inches. Shape fusiform, usually straight, tapering from medial to base and apex, with a definite constriction or neck apparent. Cross-section nearly circular at base, triangular at medial and apex. Color medium green rather prominently marked with tip stripes one-quarter the length of the fruit. Tubercles rather numerous and prominent, particularly towards the base. Spines black. Flesh moderately thin and greenish white to yellow in color. Seed mass moderately large and solid.

Pickles long fusiform, thickest at the medial and tapering toward each end, finely ridged. Color medium to dark green, tinted greenish white near apex. Tubercles many, prominent.

Fushinari.

This is a Japanese forcing variety. It is not known when this variety was first introduced to the American trade, although it has been distributed by the Oriental Seed Co., San Francisco, California, at least since 1927.

The fruits are similar in some respects to those of China Long, although those of the latter are considerably longer, somewhat more angular in cross-section and slightly darker green in color. Although prominent tubercles are common to both varieties, the color of the spines differ, those of Fushinari being black.

Vines very vigorous, profusely branched with terminal shoots extended nearly upright from the ground. Leaves very large, distinctly wrinkled and borne on long petioles.

Fruit medium long and slender, 8-9 x $1\frac{1}{2}$ - $1\frac{3}{4}$ inches. Shape oblong, straight; base distinctly rounded, medial even, apex moderately rounded to very slightly tapering. Cross-section circular at the base, moderately triangular at the apex and medial. Color light green, tinted yellowish green at tip and near medial; marked with narrow, rather obscure tip stripes which extend one-third the length of the fruit. Tubercles few, large and prominent. Spines black. Flesh medium thick, distinctly greenish white in color. Seed mass medium large, with a distinct triangular cavity at medial.

Geneva. Refs. 22, 23.

Several important American varieties of forcing cucumbers were obtained by crossing the English forcing types on the American garden sorts. Such well-known varieties as Davis Perfect, Deltus, Rawson Hot House and Abundance owe their existence to such a procedure. Growers undoubtedly used the English types more because of their great length and smoothness of skin, than for their tendency to produce parthenocarpic fruits.

At least two projects were initiated by Experiment Station workers to utilize the parthenocarpic character (the ability to produce fruits without fertilization) of the English cucumber. One of these was started by Richard Wellington in 1916 at the Minnesota Agricultural Experiment Station when he crossed Arlington White Spine with Rockford Market. After several years of selection, during which time there were many interruptions, the line now known as Geneva was introduced in 1930 from the New York (Geneva) State Experiment Station.

The fruits are borne in great profusion and differ from Arlington White Spine in being distinctly more constricted or "necked" at the base.

Fruit long and medium plump, 10-12 x $2\frac{1}{4}$ - $2\frac{1}{2}$ inches. Shape cylindrical, straight and symmetrical; base distinctly and abruptly tapered, almost constricted, medial very slightly swollen but often practically even; apex rounded. Cross-section distinctly circular in all portions. Color rather light grayish green over the entire surface, very sparsely and obscurely striped at the tip for one-quarter to one-third the length of the fruit. Tubercles very few, obscure with skin surface practically smooth. Spines white, obscure. Flesh very thick, fine, crisp, white in color. Seed mass very small and distinctly solid, containing very few to no seeds.

Giant Pera. Refs. 3, 6, 10, 11, 12, 13, 20, 21, 48, 49, 56, 62, 63, 64, 75, 81, 82. Syns. Grand Pera, Long Giant Pera, Long Green Giant Pera, Mammoth Giant Pera, New Giant Pera, Pera.

To Dr. Harris of Philadelphia, Pennsylvania, goes the credit of bringing to this country this unusual variety from Turkey. It came to the attention of W. Atlee Burpee of Philadelphia who, in 1886, introduced it to his trade. The firm of Johnson and Stokes of the same city also played an important part in the distribution of this variety having listed it at least as early as 1892.

The fruits are about the same length and plumpness of Long Green Turkey, but differ from that variety in being fuller at the apex, distinctly more constricted at the base and much smoother-skinned. The flesh is similar in color and decidedly thicker than that of many American sorts such as Longfellow, Evergreen White Spine and Early Fortune.

Fruit very long and moderately plump, 12-15 x $2\frac{1}{2}$ -3 inches. Shape nearly cylindrical but often enlarged or swollen near the apex; straight; base tapered, often constricted, and apex abruptly tapered to rounded. Cross-section circular at all portions. Color light green with tip stripes at the apex which are narrow, rather prominent and extend one-quarter the length of the fruit. Tubercles few and very obscure, leaving skin very smooth. Spines black. Flesh is very thick, fine and firm, greenish white in color. Seed mass small and solid.

Grow Quick.

This is a very early and productive variety selected out of Chicago Pickling and introduced by the Vaughan Seed Store in 1929. The fruits were about the same size as those of Chicago Pickling, but more oval in shape and less tapering towards the apex. Its earliness and productivity were its outstanding attributes at the Geneva trials.

Fruit short and moderately slender, 5-6 x 2-2¼ inches. Shape short oval, often slightly curved; base distinctly tapered, medial moderately swollen and apex moderately rounded. Cross-section nearly circular at base, and distinctly triangular at medial and apex. Color light green, tinted yellowish green at the apex; tip stripes rather prominent, extend one-third to one-half the length of the fruit. Tubercles few and obscure. Spines black. Flesh medium thick and greenish white in color.

Pickles moderately tapering at both ends, distinctly triangular in cross-section. Color light green, tinted greenish white at apex. Tubercles many, rather prominent. Flesh distinctly greenish white.

Henderson's Perfected. Refs. 20, 49, 57, 61, 75, 82.

Syns. Perfect White Spine, Perfected White Spine, Perfection White Spine, The Henderson.

Peter Henderson, after many years of selection, introduced this sort in 1900 as "the most perfect of the White Spines yet obtained." It has apparently met the requirements of many growers during the past 35 years, for it is still featured by the originator and included by some of the leading wholesale seed dealers in the country.

The fruits are 3-4 inches shorter than those of Evergreen White Spine, slightly more slender, more nearly circular, more rounded at the ends and nearly as well colored. The flesh of the two are much alike, although that of the Henderson is more nearly white in color.

Fruit medium long and medium plump, 7-8 x 2½-2¾ inches. Shape nearly cylindrical, straight; base rounded, medial slightly swollen, apex abruptly tapered; ridges rather obscure. Cross-section circular at the base and slightly triangular at medial and apex. Color dark green, tinted greenish white at apex; tip stripes rather prominent, extend one-quarter to one-third the length of the fruit. Tubercles moderately few, not very prominent. Spines white. Flesh medium thick, crisp and firm, white in color. Seed mass moderately large, usually solid.

Hescrow. Refs. 29, 59.

In 1910 A. H. MacClennan, at the time lecturer at the Ontario Agricultural College at Guelph, crossed Sutton's Everyday with Fisk's White Spine, then the resulting hybrid was crossed with Princess. After several years of selection a limited amount of seed of the final hybrid, Hescrow, was sent out for trial in 1920.

The fruits are 8-10 inches long and about 2 inches in diameter, smooth, straight, well rounded at the ends and moderately dark green in color. They are shorter than the Geneva, more symmetrical and somewhat darker in color.

Highest Quality.

Many selections of White Spine have been made. Highest Quality is one which originated with the Rutledge Seed and Floral Co., Portland, Oregon, sometime previous to 1918. As grown at Geneva, it was one of the earliest slicing sorts, coming into season soon after

the pickling varieties were well into production. The variety is decidedly more slender than Arlington White Spine, more uniformly fusiform, darker green in color and about the same length. Its earliness and uniformity are its most valuable attributes.

Fruit moderately short and moderately slender, 6-7 x 2-2¼ inches. Shape oblong fusiform, straight; base abruptly tapered to rounded, medial swollen and apex tapering. Cross-section nearly circular at base, triangular at medial and apex. Color moderately dark green, tinted dull greenish white at apex; tip stripes narrow, not very prominent, extend one-third the length of the fruit. Tubercles few and rather obscure. Spines white. Flesh medium thick, greenish white in color. Seed mass medium large, with a distinct triangular cavity at the center.

Iceland. Syn. Burbank's Iceland.

Luther Burbank of Santa Rosa, California, crossed the Lemon cucumber with Burpee's Long Snow-white and in 1917 introduced one of the selections as Iceland. This was slightly more oblong than Lemon and was more distinctly marked with green, especially along the furrows.

Fruit very short and moderately plump, 3½-4 x 2½-2¾ inches. Shape short oval, symmetrical; base and apex rounded. Cross-section circular. Color nearly white, often regularly streaked with a pale greenish, narrow lace-like color pattern to conform with the shallow furrows. Tubercles obscure. Spines black. Flesh very thin, pale greenish white, very crisp and tender. Seed mass very large, solid, containing many seeds.

Improved Long Green. Refs. 3, 6, 7, 8, 9, 10, 12, 13, 16, 18, 19, 21, 22, 29, 34, 53, 55, 56, 57, 58, 60, 61, 62, 65, 70, 72, 74, 75, 79, 81, 82. Syns. California Long Green, Common Long Green, Diamond Long Green, Early Long Green, Excelsior, Excelsior Long Green, Extra Early Long Green, Extra Long Green, Improved Extra Long Green, Improved Special Strain Long Green, Indianapolis Long Green, Kilgore's Dark Long Green, Landreth's Long Slim, Landreth's Long Slim Pickle, London, London Extra Long Green, London Long Green, London Pickler, Long Green, Long Green Common, Long London Green, Long Slim, Mammoth Long, Milwaukee Long Green.

This is a selection from Long Green Turkey and was listed by Prince at least as early as 1842. Another selection was made from the same variety in 1870 by D. M. Ferry & Co., and was introduced by that concern two years later. This stock has become very widely grown and is still one of the largest sellers.

The fruits are 2-3 inches longer than those of Davis Perfect, somewhat more plump, much more abruptly tapering at the ends, and have a more uneven, bumpy skin surface. Improved Long Green is slightly shorter than Long Green Turkey distinctly less tapered or constricted at the base, and has more nearly white flesh.

Fruit long and moderately plump, 10-12 x 2½-2¾ inches. Shape much elongated, straight, gently tapered towards the base, slightly swollen at the medial and abruptly tapered at the apex; surface uneven and bumpy. Cross-section circular at the base, triangular at medial and apex. Color moderately dark green, sparsely tinted with yellowish white at apex; tip stripes slightly prominent and extend usually less than one-quarter the length of the fruit. Tubercles rather numerous, large and coarse, very



PEERLESS WHITE SPINE

(Natural size)



PRICE'S HYBRID

(Natural size)

prominent. Spines black. Flesh thick, firm, white in color. Seed mass moderately small, solid.

Irish Queen. Syn. New England.

Irish Queen introduced in 1916 by S. M. Isbell & Co., Jackson, Michigan, was quite distinct in that the fruits were smooth and quite free from spines. In many respects the variety resembled Emerald, a variety which had been introduced about twenty years earlier. It differed from that variety in being more grayish green in color, in having flesh more greenish white in color, and in having a less solid seed mass.

Fruit moderately short and moderately plump, $6-7\frac{1}{2} \times 2\frac{1}{2}-2\frac{3}{4}$ inches. Shape nearly cylindrical, straight; base slightly swollen and rounded; apex rounded. Cross-section circular at the base, very nearly circular at medial and apex. Surface very smooth. Tubercles absent. Skin color medium to light grayish green, uniformly distributed over the surface; tip stripes very obscure, possibly one-half inch long. Spines white. Flesh thick, greenish white in color. Seed mass small, with triangular cavity present at center.

Japanese Climbing. Refs. 5, 6, 11, 12, 13, 21, 34, 57, 61, 63, 64, 66, 75. Syns. Japan Climbing, Japan Dark Green, Japanese, Japanese Climbing Green, New Japanese Climbing.

The seed of this variety came originally from Japan and was listed by Thorburn in 1892, by Gregory and by Rawson in 1894. The interesting character as noted by Gregory was that the runners kept their tips raised from the ground like squash vines. Rawson stated that the vines were of vigorous growth and that they developed strong grasping tendrils, which enabled them to climb trellises, wire netting, brush or any other suitable support. The variety is listed today as a distinct climbing sort for covering fences or trellises.

The fruits are 2-3 inches shorter than Davis Perfect, more nearly cylindrical and considerably lighter green in color. They are similar in some respects to China Long, but are much shorter and more circular in cross-section.

Fruit medium long and moderately slender, $7-8 \times 2-2\frac{1}{2}$ inches. Shape nearly cylindrical, straight, rounded at the base and apex, slightly swollen at the medial. Cross-section circular at base, nearly circular at medial and apex. Surface rather uneven and finely ridged. Tubercles few, but rather large and prominent. Color medium to moderately light green, profusely speckled with yellowish green over much of the surface; tip stripes narrow, not very prominent, and extend about one-quarter the length of the fruit. Spines black. Flesh moderately thin, very tender and crisp, slightly tart, distinctly greenish white in color. Seed mass moderately large and solid.

Mature fruits deep russet in color, often partially covered with a slight netting.

Jersey Pickling. Refs. 3, 17, 18, 19, 21, 22, 57, 61, 75. Syns. Early Long Pickling, Extra Long Green Pickling, Improved Jersey Pickle, Improved Long Green Pickling, Jersey Extra Early Prolific Pickle, Jersey Pickle, Jersey Pride, Perfected Jersey Pickle, Perfected Pickle.

During the last quarter of the nineteenth century the region in Burlington County, New Jersey, along the Delaware River was the leading pickle raising section of the country. Both the Long Green and the

Short Green varieties were grown and many local strains were developed. One of these was intermediate between Long Green and Short Green and became known as Jersey Pickle. It resembled Early Cluster in its external characters, but the fruit was rather more cylindrical and somewhat later in maturing. It was said to "green" better than any other variety. Jersey Pickle is used today for dill and ripe, sweet chunk pickles, for it is generally considered too slender and long for the smaller sizes.

Fruit medium long and moderately slender, $7-8 \times 2-2\frac{1}{4}$ inches. Shape somewhat mildly fusiform, straight, tapered gently from medial towards base and apex, base slightly constricted; ridges obscure. Cross-section circular at base and nearly circular at medial and apex. Tubercles few, rather distinct. Color medium green, tinted yellowish white at apex; tip stripes rather narrow, rather obscure and extend about one-quarter length of fruit. Spines black. Flesh moderately thick, white.

Pickles long oval, rounded at the base, tapering towards the tip, long in proportion to thickness; rather distinctly ridged; medium green in color.

Khiva. Refs. 3, 6, 16, 18, 19, 58, 75, 79. Syns. Brown Netted, Early Netted Russian, Khiva Netted, Long Netted Russian, Netted Russian, Russian Netted Cluster.

The catalog of B. K. Bliss & Sons, New York, for 1880 stated that the introduction of the Khiva-Netted cucumber into Europe resulted from the Russian expedition into Khiva. The exact date of its introduction to this continent is unknown, but inasmuch as it was not described by Burr in 1863, it is assumed that it was brought in after that time. The description of Russian Netted given by Gregory in his catalog for 1875 is so similar to that of Khiva that the two are considered identical. The Russian Netted was native to the Ukraine. This variety was early and hardy, and for this reason was favorably considered during the next twenty years. The fruits were $1-1\frac{1}{2}$ inches longer than those of Early Russian, much the same shape, considerably darker green in color, and had a more distinct netted appearance at full maturity.

Fruit short and moderately plump, $4-5 \times 2\frac{1}{2}-3$ inches. Shape short oval, straight, symmetrical; base and apex rounded, medial even to slightly swollen. Cross-section circular at base; moderately triangular at medial and apex. Color dark green at base, gradually blending to greenish white at apex; tip stripes prominent. Tubercles moderately few, slightly prominent. Spines black. Flesh thin, greenish white. Seed mass large. Mature fruits dark russet brown in color; skin tough and hard, covered with light, finely interlaced network of shallow cracks.

Kirby. Refs. 22, 29, 57. Syns. Black Diamond, D. & B. Special, Dark Green, Dark Green Slicer, Earliest Black Diamond, Green Pack, Kirby's Stays Green, Stay Green, Sunny South.

The Kirby was introduced about 1920 by I. N. Simon & Son of Philadelphia. The name came from its originator, Norval E. Kirby, at that time associated with Mr. Simon. The name was registered through the United States Patent Office. During the fifteen years it has been offered it has grown in popularity and is believed to be unexcelled in its class for earliness, color and heavy yielding.

The fruits are 1-2 inches shorter than Davis Perfect,

slightly more slender, distinctly more rounded at the ends, fully as dark in color and much smoother skinned.

Fruit medium long and moderately plump, 8-9 x $2\frac{1}{2}$ - $2\frac{3}{4}$ inches. Shape long oval, straight; base rounded, medial slightly swollen, and apex moderately rounded, depressions and ridges very slight; cross-section circular at base, slightly triangular at medial and nearly circular at apex. Color dark green, tinted yellowish white at apex; tip stripes rather broad and prominent, extending one-third the length of the fruit. Tubercles few and obscure, surface smooth. Spines white. Flesh medium thick, crisp, greenish white in color. Seed mass moderately large and solid.

Klondike. Refs. 11, 13, 22, 29, 52, 57, 75. Syns. Everlasting, Extra Early Klondike, Klondike Long White Spine, Klondike White Spine, New Klondike, New White Spine, Sterling.

The variety Klondike was introduced by D. V. Burrell of Rocky Ford, Colorado, in 1902, and soon came to be considered one of the leading varieties for shipping to northern markets. It was introduced with the belief that the color was darker green and remained longer without fading than in any other sort yet developed. Klondike is still considered favorably in some areas.

The fruits are 4-5 inches shorter than Evergreen White Spine, about as plump, more abruptly tapered at the ends, more triangular in cross-section, and have broader tip stripes. The green color of the two are much the same.

Fruit medium long and moderately plump, 7-8 x $2\frac{1}{2}$ -3 inches. Shape elongated, straight; abruptly tapered at both ends; medial slightly swollen; ridges rather prominent. Cross-section circular at base, triangular at medial and apex. Tubercles few, obscure; surface moderately smooth. Color very dark green, with tip stripes rather broad and prominent, extending one-quarter to one-third length of the fruit. Spines white. Flesh moderately thick, greenish white in color.

Mature fruits pale greenish yellow in color.

Lemon. Refs. 22, 57, 75. Syns. Apple Shaped, Garden Lemon.

This novelty was noted in the 1894 catalog of Samuel Wilson, Mechanicsville, Pennsylvania, in the 1908 catalog of Thorburn & Co. and in 1909 by Aggeler & Musser of Los Angeles. In 1918 Joseph Harris, Coldwater, New York, aptly illustrated the Lemon cucumber and wrote "This is a real cucumber that grows about the size and shape of a lemon." In Australia, under the name Apple Shaped, it is well established and is sold on the markets in large quantity. In this country the variety has been most favorably received in California. Although Lemon cucumber is often used to designate a variety of *Cucumis melo* var. *chito*, the name is used commonly in America as "for" a multi-locular form of *C. sativus*.

Fruit very short and plump, $3\frac{1}{2}$ x $2\frac{1}{2}$ inches. Shape broad, short oval, cylindrical, symmetrical; base and apex rounded, ridges slightly pronounced. Cross-section circular to somewhat pentagonal at all portions. Tubercles very numerous, minute. Color pale greenish yellow turning to lemon yellow then to golden yellow at full maturity; tip stripes barely apparent. Spines black, many, transparent at certain stages. Flesh very thin, white, faint lemon-like flavor in late stages of development. Seed mass very large, greenish white, many-seeded, attached to five placentae, pentagonal cavity in center.

Long Grecian. Refs. 3, 9, 16, 18, 19, 58, 60, 75, 82. Syns. Athenian, Athens, Extra Long Green Smooth, Extra Long Smooth, Grecian, Long Green Smooth, New Long Grecian.

This was a European variety listed by Hovey & Co. in 1870, by Gregory in 1885 and by Maule in 1889. It was grown at Geneva and described in the annual report of this Station for 1887. In spite of the somewhat attractive long fruits, it never became very popular, because of the relative unproductiveness of the plant.

Fruit long and moderately plump, 10-12 x $2\frac{1}{2}$ -3 inches. Shape nearly cylindrical, straight; base tapered, often necked or constricted; apex rounded, medial even. Cross-section nearly circular at all portions. Color bright green, somewhat lighter near apex. Surface somewhat uneven, shallowly furrowed. Tubercles absent. Spines black. Flesh thick and white in color. Seed mass small.

Long Green Turkey. Refs. 3, 9, 11, 12, 13, 15, 16, 17, 19, 21, 25, 46, 48, 57, 75. Syns. Extra Early Green Turkey, Green Turkey, Improved Extra Long Green Turkey, Landreth First, Landreth First Early, Long Smooth Green Turkey, Long Turkey, Turkey.

Mawe and Abercrombie in 1778 described the Long Smooth Green Turkey thus, "The plants are strong growers with very large leaves and long, smooth, green rinded fruit, without prickles, attaining from ten to fifteen inches in length." Burr in 1863 gave considerable emphasis to the variety, noting particularly the long slender form contracted towards the stem and swollen towards the opposite end, the few seeds, and remarkably firm and crisp flesh. Long Green Turkey was the prototype for Improved Long Green, the standard cucumber for many years for both slicing and pickling purposes.

Longfellow. Ref. 22. Syns. Cliffwood Longfellow, Fairfield Giant, New Longfellow, Penny Pack Valley.

Longfellow was introduced in 1927 by Jerome B. Rice Seed Co., Cambridge, New York. The variety was developed from a cross in which one parent was the dark colored Emerald. It produces a very attractive fruit and has been used by the private gardener and the truck grower as a "straight pack" sort for shipment to high grade markets.

The fruits are about 2 inches shorter than those of the Vaughan, considerably more slender, much more uniformly rounded at the ends and somewhat darker green in color.

Fruit long and moderately plump, 10-12 x $2\frac{1}{4}$ - $2\frac{1}{2}$ inches. Shape cylindrical, elongated, symmetrical, straight; base rounded and apex abruptly tapered. Cross-section circular at base, nearly circular at medial and apex. Tubercles moderately few, slightly prominent. Color very dark green; tip stripes rather obscure, dark yellowish green, very narrow and extend one-quarter the length of the fruit. Spines white. Flesh moderately thick, greenish white in color. Seed mass moderately small and solid.

Mountain Perfection. Ref. 22.

This variety was introduced in 1928 by Grand Junction Seed Co., Colorado. It is a late variety



MATURE CUCUMBER FRUITS TO ILLUSTRATE VARIETAL COLOR RANGE

(Natural size)



SALAD



WHITE WONDER

(Natural size)

producing long, attractive, rather smooth, dark green fruits. In type it somewhat resembles the Vaughan but is smoother and has less prominent tubercles.

Fruit very long and moderately plump, 12-14 x $2\frac{1}{2}$ - $2\frac{3}{4}$ inches. Shape much elongated, symmetrical, slightly curved. Base tapering, often somewhat constricted, medial even, apex slightly tapered; ridges and depressions slight. Cross-section circular at base, slightly triangular at medial and moderately triangular at apex. Color moderately dark green over most of the surface; tip stripes very narrow and very inconspicuous, often nearly absent, not to exceed one-eighth the length of the fruit. Tubercles medium many, and rather obscure. Spines, white. Flesh medium thick, very firm, greenish white in color. Seed mass medium large and solid.

Muscatine Pickling.

This was a pickling strain of western origin, symmetrical, of deep green color, blunt ended and very desirable. It was introduced in 1910 by D. M. Ferry & Co., Detroit, Michigan, and cataloged until 1916.

National Pickle. Ref. 22. Syn. National Association Pickling.

In 1924, after it had become apparent that there was no one variety adaptable both for small pickle sizes and dills, the National Pickle Packers Association appointed a committee to work with the Michigan Agricultural Experiment Station in breeding a new strain which would combine the desirable characteristics of the best varieties. George Starr began work on the problem at Michigan, and after five years a strain was deemed sufficiently fixed to be introduced. It was distributed through the Association and given the name National Pickle. Although this new variety has been tested and favorably reported by the packers from coast to coast, it has just begun to find its place among the established sorts.

The fruits of this variety are intermediate in size to those of Chicago and Snow. It is most like Snow in shape, although the pickles of the latter are often somewhat more tapered at the tip than are those of National Pickle.

Fruit short and slender, $5\frac{1}{2}$ -6 x $1\frac{3}{4}$ - $1\frac{7}{8}$ inches. Shape nearly cylindrical, slightly enlarged at base, straight; base rounded, medial even; apex nearly rounded. Cross-section circular at base and medial, somewhat triangular near apex. Tubercles moderately many, rather obscure. Color medium green, tinted yellowish white near apex; tip stripes narrow, yellowish green in color and extend one-third the length of the fruit. Spines black. Flesh thin, greenish white. Seed mass large and solid.

Pickles oval to cylindrical, rounded at the base and nearly so at the apex; cross-section nearly circular, occasionally somewhat triangular, depressions very slight. Color moderately dark green at the base and rather light to medium green at medial and apex.

Nichol's Medium Green. Refs. 3, 6, 11, 12, 13, 14, 18, 19, 20, 48, 49, 56, 57, 64, 75, 79, 82. Syns. Medium Green, Medium Pickling, Nichol's Green.

This was one of the first important varieties introduced after Burr published his book in 1863. A. W. Livingston & Sons, Columbus, Ohio, obtained seed of this new strain in the late seventies and after some years trial offered it in 1884 as a novelty. This listing was followed by that of Peter Henderson & Co., in 1886 and by D. M. Ferry & Co., in 1888. In type it somewhat resembled Early Frame and Green Prolific.

Fruit moderately short and moderately plump, 6-7 x $2\frac{1}{2}$ -3 inches. Shape short oval, straight; rounded at the base; medial slightly swollen; apex rounded to slightly tapering, ridges rather marked. Cross-section nearly circular at base, moderately triangular at medial and apex. Color rather light green, profusely tinted with yellowish white at apex and medial; tip stripes prominent, extend one-third the length of the fruit. Tubercles few, obscure. Spines black. Flesh medium thick, crisp, white in color. Seed mass moderately large, usually solid, occasionally with triangular cavity at center.

Parisian Pickle. Refs. 6, 13, 20, 57, 58, 60, 62, 63, 75, 79. Syns. Improved Bourbonne, Long Green Parisian, Long Parisian, Paris Early Cluster Pickle, Paris Pickling, Parisian Prolific Pickling.

This is a French variety known in Europe as Improved Bourbonne and used extensively for the manufacture of gherkins or cornichons much the same as the West India Gherkins are used in America. When the variety was brought to America for the first time is not known, although Gregory listed it as early as 1892.

In many respects it resembles the Cumberland and the Danish Pickle, but Parisian Pickle is intermediate in size. The color is much the same, being decidedly darker green than any of the commonly used pickling varieties in this country.

Fruit moderately long and medium plump, 9-10 x $2\frac{1}{4}$ - $2\frac{1}{2}$ inches. Shape nearly cylindrical, straight but often slightly curved; base tapered, medial slightly swollen and apex abruptly tapered. Tubercles very numerous, rather small, prominent. Cross-section nearly circular at all portions. Color dark green, sparsely striped at the apex. Spines black, small, very numerous. Flesh thick, greenish white in color. Seed mass small and solid.

Pickles long, slender, cylindrical, often curved; tapered at base and apex; medial even; ridges obscure; cross-section circular. Color dark green, except at extreme apex. Spines black, very numerous, hair-like. Flesh thick and seeds inconspicuous.

President.

Information regarding the origin of President cucumber is not available. It was introduced in 1928 by Walter S. Schell, Inc., Harrisburg, Pennsylvania. The fruits are very attractive in appearance and resemble Emerald and Straight Eight. The fruits are slightly longer than those of Straight Eight, somewhat more plump and not quite as dark in color.

Fruit moderately long and moderately plump, 9-10 x $2\frac{3}{4}$ -3 inches. Shape cylindrical, straight, symmetrical. Base rounded, medial even and apex rounded. Cross-section circular at all portions. Color dark green, finely speckled over most of the surface with pale greenish yellow; tip stripes narrow, rather prominent, less than one-quarter the length of the fruit. Tubercles few and very obscure; surface smooth, even at the pickling stages. Spines white. Flesh thick, greenish white in color. Seed mass small and solid.

Roadside Market Wonder. Ref. 22.

This is an exceedingly vigorous variety introduced in 1927 by the Grand Junction Seed Company, Grand Junction, Colorado. It is very similar to Vaughan, being slightly shorter and decidedly smoother with less taper or constriction at the base.

Fruit long and medium plump, 10-12 x $2\frac{1}{4}$ - $2\frac{3}{4}$ inches. Shape cylindrical, slightly curved. Base tapering, medial slightly swollen, apex abruptly tapered. Cross-section circular at all portions. Color moderately dark green, tinted with yellowish

white at apex; tip stripes very narrow, not prominent and extend one-quarter or less the length of the fruit. Tubercles few and obscure. Spines white. Flesh very thick, greenish white in color. Seed mass very small, solid.

Salad. Syn. White.

This novelty originated with Mrs. T. P. Mony of Oakland, California, who sent a few seeds to Aggeler & Musser of Los Angeles, California, in 1920. After a year's trial it was introduced as White, although in 1924 the name was changed to Salad, and as such is still offered.

The fruits are most like those of White Wonder, but differ from that variety in color, being more greenish yellow at the immature stage and brighter lemon yellow at full maturity.

Fruit moderately short and moderately slender, $6-7 \times 2-2\frac{1}{4}$ inches. Shape irregularly oval, straight; base rounded, usually larger than apex, medial somewhat unevenly swollen, apex tapered. Cross-section nearly circular at base, triangular at medial and apex. Color pale greenish yellow at immature stage, changing to lemon yellow and at full maturity bright yellow. Tubercles moderately few but prominent. Spines black. Flesh uneven in thickness, thinner along furrows, very juicy and mildly flavored. White in color. Seed mass large, with small triangular cavity present at center, tissue light green in color.

Siberian. Refs. 6, 12, 13, 14, 21, 23, 49, 57, 63, 75, 79.

Syns. Early Siberian, Extra Early Siberian, New Siberian.

This small early sort was introduced by Northrup, Braslan and Goodwin of Minneapolis, Minnesota, in 1889. No definite information concerning its origin is available although its name would lead one to suspect its relationship to Early Russian. The fruits are $1\frac{1}{2}-2$ inches longer than those of Early Russian, slightly more tapered at the base, much the same color, and distinctly more spiny.

Fruits short and slender, $5-5\frac{1}{4} \times 1\frac{7}{8}-2$ inches. Shape short oval, straight, symmetrical; base abruptly tapered, medial even and apex rounded. Cross-section nearly circular in all portions. Color medium to rather light green over the entire surface; tip stripes prominent and extend one-half the length of the fruit. Tubercles many, very small, pimple-like. Spines black, very many.

Mature fruits orange brown in color with skin considerably cracked, much like that of Netted Russian.

Snow's Pickling. Ref. 22. Syns. Fancy Pickle, Fancy Pickling, Snow's Early, Snow's Fancy Pickling, Snow's Perfected Pickle.

To Mr. J. C. Snow of the famous Snow Pickle Farm of Rockford, Illinois, goes the credit of originating this very popular pickling variety. It resulted from a selection made by Mr. Snow out of Chicago Pickling sometime prior to 1905 after which it was listed by the Vaughan Seed House of Chicago, Illinois. The fruits are a little shorter than those of Chicago Pickling and lack the heavy shoulders at the stem end of that variety. It is primarily used for small pickle manufacture, for it is usually considered to be too short and chubby for good dill size.

Fruit short and slender, $5-6 \times 1\frac{1}{2}-1\frac{3}{4}$ inches. Shape nearly cylindrical, straight, moderately symmetrical; base rounded, medial even, slightly tapering to base and abruptly tapered to rounded apex. Cross-section nearly circular at base, slightly triangular at medial

and apex. Color moderately dark green, somewhat lighter at apex; tip stripes narrow, rather prominent and extend one-third the length of the fruit. Tubercles few, rather obscure and small. Spines black. Flesh thin, greenish white in color. Seed mass moderately large, with small triangular cavity at medial.

Pickles short oval; base rounded; apex moderately rounded; ridges obscure, depressions slight. Cross-section moderately triangular. Color moderately dark green at base, tinted greenish white at apex. Tubercles medium in number and evenly distributed.

Straight-8.

This variety, listed for the first time in 1935 was originated by Ferry-Morse Seed Co. of Detroit. Where grown in competitive trials it has received universal acclaim and received a gold medal in the 1935 All America Awards. Selections in a field of a white spined variety were first made in 1928. These selections were continued as separate lines, one of which having a high degree of fruitfulness, was considered of unusual value. Five generations of inbreeding resulted in the perfection of this new sort which was sent out for trade trial in a limited way in 1934.

Fruit medium long and moderately slender, $8-9 \times 2-2\frac{1}{4}$ inches. Shape cylindrical, very symmetrical, straight; base and apex uniformly rounded, medial even; ridges and depressions absent. Cross-section circular at all portions. Color very dark green, marked obscurely with narrow dark greenish tip stripes, one-quarter or less the length of the fruit. Tubercles moderately many, small and rather obscure. Spines white. Flesh medium thick and nearly white in color. Seed mass medium large and solid.

Tailby's Hybrid. Refs. 3, 12, 13, 16, 18, 19, 21, 26, 48, 50, 57, 75, 76, 79. Syns. Bismarck, Giant Tailby Hybrid, Improved Bismarck, New Orleans Market, Peerless New Orleans Market, Tailby.

Joseph Tailby of Wellesley, Massachusetts, was one of the first American gardeners to cross the so-called American cucumber with the English forcing sorts. He used White Spine and Dickson's All-the-Year-Round, one of the largest and most attractive sorts, to obtain his hybrid. It was exhibited for the first time at the annual show of the Massachusetts Horticultural Society in 1872 and was acclaimed a decided acquisition to the industry. Two of the first seedsmen to offer it were James J. H. Gregory of Marblehead, Mass., who included it in his catalog of 1874 and B. K. Bliss of New York in 1878. The fruits of this variety were somewhat larger than White Spine and apparently retained much of the smoothness of the English parent. Records indicate that it was a profuse yielder.

Fruit medium long and moderately plump, $8-9 \times 2\frac{1}{2}-2\frac{3}{4}$ inches. Shape oblong fusiform, straight; base and apex tapered, medial swollen; surface rather uneven. Cross-section moderately triangular at base and distinctly so at medial and apex. Color very dark green, often finely speckled with yellowish-green; tip stripes obscure and extend less than one-quarter the length of the fruit. Tubercles few, rather obscure except in young stages. Spines white. Flesh thick, white in color.

Vaughan. Refs. 22, 57.

Originally the Vaughan was a greenhouse forcing variety which was developed by a Mr. Dilger of Chicago, Illinois. It was secured by the Vaughan Seed Store and introduced to the trade in 1920. Apparently some selection was practiced, for now the variety is recom-



VAUGHAN



DAVIS PERFECT

Two-thirds natural size



WEST INDIA GHERKIN

(Three-fourths natural size)

mended by its introducer as a greenhouse cucumber suitable for outdoor growing.

The fruits are 2-4 inches longer than those of Davis Perfect and somewhat more plump. They are tapered more abruptly at the base and somewhat more abruptly at the apex and are darker green in color with less prominent tip stripes.

Windemoor Wonder, although introduced in 1917 by Stokes Seed Farms Co. originated from a cross between Telegraph and Davis Perfect. Present stocks are so much like the Vaughan that the two are considered synonymous.

Fruit very long and moderately plump, 12-14 x 2 $\frac{3}{4}$ -3 inches. Shape cylindrical, straight, symmetrical; base usually long tapered or constricted, medial even to very slightly swollen, apex abruptly tapered. Cross-section circular at all portions. Color dark green, tinted very slightly at extreme apex with dark greenish yellow; tip stripes very narrow, rather obscure and extend one-eighth or less the length of the fruit. Tubercles moderately few, large, rather prominent. Spines white. Flesh thick, very crisp, greenish white in color.

West India Gherkin. Refs. 3, 6, 7, 13, 15, 16, 19, 21, 22, 25, 56, 57, 58, 70, 75, 80. Syns. Burr, Gherkin, Jerusalem Pickle, Prickly Fruited Gherkin, Prickly Gherkin, Senfgurken, Short Green Gherkin, Small Gerkin, Small Green Pickling, Small West Indian Gherkin, West India, West India Burr, West Indian Gherkin.

Although this sort belongs to the species *Cucumis Anguria*, its widespread usage as a pickling sort, qualifies it for inclusion in this account. As pointed out in the first chapter, the variety is believed to have originated in Africa from whence it was transported to the West Indies. It was introduced to the United States from Jamaica by Minton Collins of Richmond, Virginia, in 1793. M'Mahon included it in his Gardeners Catalogue of 1806 and Comstock, Ferre of Wethersfield, Connecticut, listed it at least as early as 1846.

The fruits are obviously entirely distinct from any other cucumber. Although it is exceedingly prolific and apparently somewhat resistant to the common diseases of *Cucurbitaceae*, it has a rather limited usage.

Plants very vigorous, slender vines, 7-8 feet long, profusely branched. Leaves small and moderately broad, very deeply and profusely lobed, much like those of the watermelon, slightly pubescent, nearly smooth.

Fruit very small, very short and plump, 2-2 $\frac{1}{2}$ x 1 $\frac{1}{4}$ -1 $\frac{1}{2}$ inches. Shape short oval, cylindrical, straight and symmetrical; rounded at base and apex, even at the medial. Cross-section circular at all portions. Ridges and depressions absent. Color very pale green, rather glossy. Spines pale green, very numerous, fleshy, short and thick. Flesh very thin, tough, distinctly greenish in color. Seed mass very large, solid; containing an abundance of very small seeds. Stem at least 3 times as long as the fruit, tapering from base of fruit to the vine.

White German. Refs. 3, 4, 11, 17, 18, 19, 21, 48, 73, 75, 82. Syns. Extra Long White, Giant White, Long Snow White, Long White, New Giant White, Panmure Long White, White Dutch.

A long white cucumber has been recorded at least as early as 1778 when Mawe and Abercrombie included Long Smooth White Turkey in their discussion of varie-

ties. It is not known when this type was introduced to America, however, Gregory is known to have cataloged White German as early as 1881 and continued it for many years. Various names have been applied to the type, perhaps the most recent being that of Panmure Long White listed by Maule in 1913 and continued until 1926.

The fruits were considerably longer than White Wonder, much less warted and decidedly more circular in cross-section. The type is no longer offered by American seedsmen.

Fruit long and medium plump, 10-12 x 2 $\frac{1}{4}$ -2 $\frac{1}{2}$ inches. Shape nearly cylindrical, straight; base abruptly tapered, medial even to slightly swollen, apex rounded. Cross-section nearly circular at all portions. Color greenish white, cream or ivory white at full maturity. Tubercles rather obscure. Spines black. Flesh white, very thick.

White Wonder. Refs. 6, 11, 13, 21, 57, 63, 64, 65, 75. Syns. Albino, Ivory King, Jack Frost, Landreth's White Slicing, White Albino.

The seeds of a white cucumber were sent to W. Atlee Burpee of Philadelphia from a customer in Western New York in the spring of 1890. In trial this was thought to have considerable merit and was, accordingly, introduced by the firm in 1893. Nothing is known concerning the origin or development of the variety, but since white fruited sorts were known to be in existence, it is highly probable that it came as a selection from White Pearl, White Spanish, or a similar sort.

The fruits are much like those of the Salad cucumber and differ chiefly from that variety in color of skin, that of White Wonder being nearly greenish white to ivory white throughout the various stages of its growth.

Fruit moderately short and medium plump, 6-7 x 2 $\frac{1}{4}$ -2 $\frac{1}{2}$ inches. Shape somewhat irregularly oval; base rounded, medial somewhat swollen, one side more so than the other, apex abruptly tapered. Cross-section nearly circular at base, decidedly triangular at medial and apex; depressions and ridges marked. Color ivory white at slicing stage to ivory yellow at maturity. Tubercles moderately many, prominent. Spines black, although those about the base of the stem appear to be white. Flesh moderately thin, crisp, firm, very mild, nearly white in color. Seed mass moderately large, solid and pale green in color.

Woodruff Hybrid. Refs. 22, 57. Syn. New Hybrid Spine.

This variety was developed by a grower in Massachusetts from a cross between Arlington White Spine and one of the long smooth English forcing cucumbers. It was introduced by F. H. Woodruff and Sons of Milford, Connecticut.

The fruits are somewhat like those of Davis Perfect in size, but have more abruptly tapered ends, more prominent tubercles and are somewhat more triangular in cross-section.

Fruit moderately long and medium plump, 9-10 x 2 $\frac{1}{4}$ -2 $\frac{1}{2}$ inches. Shape nearly cylindrical, straight; base rounded to abruptly tapered, often slightly swollen; medial slightly swollen, apex abruptly tapering; ridges and depressions rather marked. Cross-section triangular at all portions. Color dark green; tip stripes prominent and extend one-quarter to one-third the length of the fruit. Tubercles moderately many, very prominent. Spines white. Flesh moderately thick, very fine and crisp, greenish white in color. Seed mass moderately small and solid.

SUPPLEMENTARY LIST OF OBSCURE VARIETIES

The names given below represent varieties which can be considered of minor importance and about which little information is available; varieties of forcing cucumbers about which no data were obtained; varieties which

were in existence for a very short period; or varieties the seed of which is not available today and therefore no plantings could be made to determine their status with reference to recognized standard sorts.

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|---|--------------------------------|----------------------------------|----------------------------------|
| Achievement. | Eskimo. Syns. Eskimoso, Extra | Japanese Climbing White. Ref. | Price's Hybrid. |
| Adams Forcing. | Early Eskimoso. Refs. 21, | 75. | Pride of Tennessee. |
| African Horned. (<i>C. dipsaceus</i>) | 65, 75. | Japanese Crystal Wax. | Princess. Ref. 59. |
| Syn. Climbing. Ref. 75. | Evergreen Pickling. | Jewel. Ref. 20. | Prize Taker. Ref. 75. |
| Alaska. Ref. 75. | Extra Early Conqueror. | King of Picklers. Ref. 75. | Prolific Forcing. |
| Arctic White. | Famous Nugreen. Syn. Nu- | Land and Water. Ref. 28. | Prosperity. |
| Arlington White Spine Forcing. | green. | Large Early Market. | Rawson's Hothouse. Refs. 29, |
| Refs. 42, 75. | Favorite Pickling. Ref. 75. | Leonard's Greenhouse. | 52. |
| Astonisher. Refs. 3, 48. | Fejina. Ref. 16. | Lilly's Pickling. | Rockford Market. Refs. 29, 75. |
| Astro. Refs. 20, 49, 66, 75. | Flanigan's Prize. | Longcu. | Rockford Pickle. Refs. 61, 75. |
| Aviator. Ref. 35. | Garden Gem. Ref. 75. | Longest of All. Ref. 3. | St. Louis Pickling. Ref. 75. |
| Black Beauty. | Gem Prolific. | Long Gem. Ref. 3. | San Francisco Pickling. Ref. 75. |
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APPENDIX

METHODS AND ACKNOWLEDGMENTS

The major descriptions of these crops are based upon data very largely obtained from extensive variety trials at Geneva during the past five years. The observations of Sturtevant and Goff (50) were of considerable value, especially in relation to varieties the seed of which is no longer obtainable. Numerous visits to seedsmen's trial grounds afforded an opportunity not only to see varieties grown under varying conditions but also to examine trial ground records and type books not otherwise obtainable.

All crops were grown according to the usual commercial practice, although in most instances the use of drill rows instead of hill planting enabled individual plants to develop in a more normal manner and afforded greater opportunity for the note taker to observe plant characteristics. Quantitative characters such as length of vine, cotyledon, leaf and fruit, size of flower, weight of fruit, etc., were carefully measured. Where significant differences were found classes (such as large, small, long, short, etc.) were formed and the relative value of each class was thus more accurately stated. The terms narrow, broad, moderately broad, etc., referring to seeds are descriptive of the relative proportion rather than the actual measurement, in other words a seed nearly as long as broad is called broad, while a seed of equal width but three times as long is called narrow.

The extreme sensitiveness of *Cucurbitaceae* to weather conditions has very largely prevented the designation of definite maturity dates for these crops. The number of days to maturity for squashes and pumpkins, the least variable from season to season, was determined by individual judgment after such factors as skin color, shell hardness and condition of the vine were taken into consideration. Such variation was found from year to year in the maturity of muskmelons (as determined by degree of stem slip and netting, skin color, etc.) that for the purpose of this publication the varieties are classified as very early, early, moderately early, midseason, moderately late and late, and their season compared with that of well known or allied varieties.

In order to compile material on the histories of the varieties, it has been necessary to seek information from a large number of individuals. This information has been freely forthcoming and has greatly facilitated the work. The authors are indebted to the Associated Seed Growers, New Haven, Connecticut, Jerome B. Rice Seed Co., Cambridge, N. Y., Joseph Harris Co., Coldwater, N. Y., F. H. Woodruff Seed Co., Milford, Conn., J. C. Robinson Seed Co., Waterloo, Nebraska, D. Landreth Seed Co., Bristol, Pa., the Ferry-Morse Seed Co., Detroit, Michigan and many others, who have cooperated to the fullest extent in furnishing information and seed for trial.

The authors extend sincere thanks to individuals in the above mentioned organizations, to many others of the seed trade and to co-workers of other educational and experimental institutions who remain unnamed because of lack of space.

GLOSSARY

| | |
|-------------------|---|
| Acorn..... | The more or less prominent, often protuberant irregular formation at the apex of the fruit of Turban squashes. |
| Apical..... | The portion at the distal end; opposite the base. |
| Aromatic..... | Possessed of spicy fragrance. |
| Auricle..... | The lobe-like portion of the leaf blade, at or near the base. |
| Basal..... | The portion at the proximal end; opposite the apex or tip. |
| Blistered..... | The presence of small eruptions and depressions over the surface of the leaf or fruit. |
| Bumpy..... | When the surface of the fruit is uneven; not definitely ribbed and furrowed. |
| Button..... | The small protuberance at the blossom end of the fruit; the fleshy style. |
| Cleft..... | When the sinus extends half way or (somewhat more) to the base or midrib and either the sinus or the lobe is narrow or acute. |
| Color..... | Given in common color terms with the approximate Ridgeway term in parenthesis. |
| Cordate..... | Heart-shaped. |
| Crumpled..... | When blistered formations are large, and excessive development of folds is present. |
| Cylindrical.... | Elongated, with the cross-section circular. |
| Dentate..... | Margin with teeth equal-sided, projecting at right angles to the blade. |
| Denticulate.... | Minutely toothed; finely dentate. |
| Entire..... | Margin without divisions, lobes or teeth. |
| Face..... | The broad side of the seed. |
| Falcate-fusiform. | Curved spindle-shape. |
| Friiled..... | When the border of the leaf is wavy to the horizontal. |
| Furrows..... | Depressions between the ribs. |
| Fusiform..... | Spindle-shaped; thickest at the medial and more or less tapering towards both ends. |
| Granular..... | When the flesh is coarse and mealy; often gritty. |
| Incised..... | When the margin is cut irregularly and sharply. |
| Inspid..... | When the flesh of a fruit is tasteless; flat. |
| Interstice..... | The area within the mesh of the cork-like netting. |
| Lacerate..... | Deeply and irregularly cut along the margin. |
| Lobed..... | When the sinus extends not more than half way to the base or midrib and either the sinus or lobe is rounded. |
| Medial..... | The center-most portion. |
| Musky..... | When the odor of the melon is more or less strong and pungent. |
| Nauseous..... | When the odor or taste of a fruit is particularly pungent, musky or overly sweet. |
| Oblate..... | Distinctly flattened at the ends; compressed globose. |
| Oblong..... | Considerably longer than broad, with nearly parallel sides. |
| Obpyriform.... | Inversely pear-shaped; the larger end at the base. |
| Ovate..... | Shaped like an egg, the broader portion at the base. |
| Parted..... | When the sinus reaches almost but not quite to the base or midrib. |

| | | | |
|-----------------|--|----------------|---|
| Pedicle..... | The flower stem. | Rind..... | That portion of the fruit enclosing the flesh; the epicarp, when more or less soft and tough. |
| Periphery..... | The area about the circumference. | Sepal..... | The calyx lobe. |
| Pock-marked... | Blotched with shallow indentures irregular in size and shape, more or less accentuated by the contrasting color pattern and netted appearance of the surrounding tissue. | Serrate..... | Margin with sharp teeth that point forward. |
| Pulpy..... | When the flesh is very coarse and exceedingly fibrous. | Shell..... | That portion of the fruit enclosing the flesh, the epicarp when hard and rigid. |
| Quality..... | Refers to the physical and chemical structure of fruit as designating its value as an edible product. | Sinuate..... | When the marginal line is more deeply waved than undulate. |
| Reniform..... | Kidney-shaped. | Sinus..... | A space or recess between two lobes. |
| Reticulate..... | Marked with a raised corky, lace-like netting on the exterior surface of the fruit, usually gray in color and variable in size and amount. | Texture..... | With reference to the structural character of the part in question; the degree of coarseness, stringiness or pulpiness. |
| Retuse..... | With a shallow notch at the apex. | Truncate..... | Terminating abruptly as though the ends were cut off; flattened or nearly so, at the ends. |
| Ribs..... | Longitudinal areas more or less extending above the surface of the fruit. | Turbinate..... | Top-shaped, with the larger end at the base. |
| | | Umbraculiform. | Shaped like an umbrella. |
| | | Undulate..... | When the margin is a wavy line bending slightly inward and out. |

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